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NEC Express5800/120Rf-1
User's Guide

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Keep this User's Guide at hand for quick reference at anytime necessary.

SAFETY INDICATIONS

Follow the instructions in this User's Guide for your safety to use the server.

The server contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards.

Server components with possible danger are indicated with a warning label placed on or around them as well as described in this User's Guide.

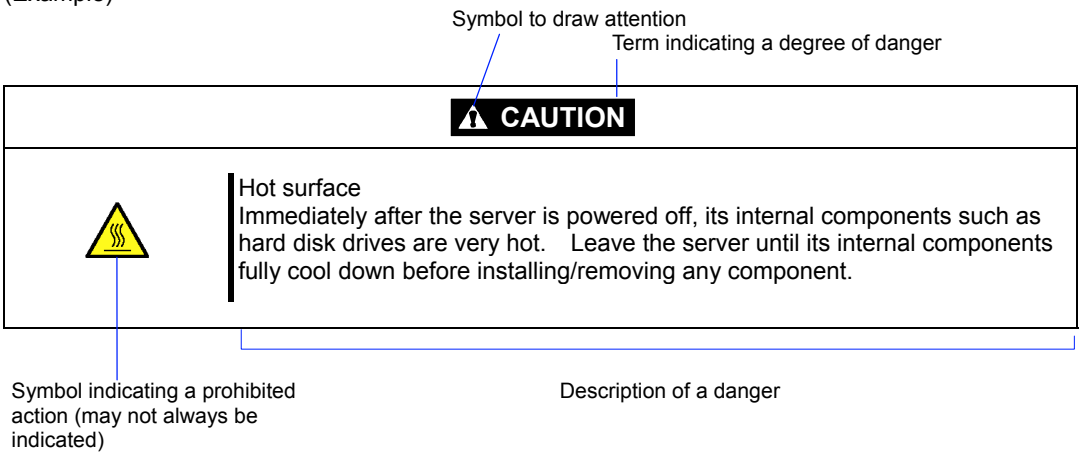
In the User's Guide or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	Indicates the presence of a hazard that may result in death or serious personal injury if the instruction is ignored.
⚠ CAUTION	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)
	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)
	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)

(Example)


Symbol to draw attention
Term indicating a degree of danger
CAUTION
Hot surface
Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.
Symbol indicating a prohibited action (may not always be indicated)
Description of a danger

SYMBOLS USED IN THIS USER'S GUIDE AND WARNING LABELS

Attentions

	Indicates that improper use may cause an electric shock.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause fingers to be caught.
	Indicates that improper use may cause fumes or fire.
	Indicates a general notice or warning that cannot be specifically identified.
	Indicates that improper use may cause loss of eyesight due to laser beam.

Prohibited Actions

	Indicates a general prohibited action that cannot be specifically identified.
	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.

Mandatory Action

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Statement

Warning: This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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Momentary voltage drop prevention:

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

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PREFACE

Welcome to the NEC Express5800/120Rf-1 server.

The NEC Express5800 server holds powerful performance and employs the latest technology to implement a computer for the next generation. With its potential capabilities, the server may be used as the workstation PC that configures a client-server system and provides high-speed processing and superior reliability.

Read this User's Guide thoroughly to fully understand handling of the server and appreciate its functions to the maximum extent.

ABOUT THIS USER'S GUIDE

This User's Guide is a guide for proper setup and use of the server.
This User's Guide also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of the server.
Keep this manual for future use.
The following describes how to proceed with this User's Guide.

How to Use This User's Guide

To aid you in finding information quickly, this User's Guide contains the following information:

Chapter 1 Notes on Using Your Server
includes information that needs attention to use the server. Make sure to read this chapter before setting up and using the server. It also includes requirements and advisory information for transfer and disposal of the server.

Chapter 2 General Description
includes information necessary to use the server, such as names and functions of its components, handling of the floppy disk and CD-ROM drives.

Chapter 3 Setting Up Your Server
tells you how to select a site, unpack the system, assemble the rack-mount subsystem, make cable connections, and power on your system.

Chapter 4 Configuring Your Server
tells you how to configure the system and provides instructions for running the BIOS Setup Utility and the Adaptec Configuration Utility, which is used to configure SCSI devices in your system. This chapter also provides information on mother board jumper settings.

Chapter 5 Installing the Operating System with Express Setup
describes how to install the operating system.

Chapter 6 Installing and Using Utilities
describes how to install the utilities for the server. It also includes a description on using the attached CD-ROM "NEC EXPRESSBUILDER".

Chapter 7 Maintenance
provides you with all the information necessary to maintain successful operation of the server. This chapter also includes a description on relocating and storing the server.

Chapter 8 Troubleshooting
contains helpful information for solving problems that might occur with your system.

Chapter 9 Upgrading Your Server
provides you with instructions for upgrading your system with an additional processor, optional memory, optional add-in cards, hard disk drives, peripheral devices, and power supply.

Appendix A Specification
provides specifications for your server.

Appendix B Other Precautions
provides supplementary notes on using the server.

Appendix C IRQ and I/O Port Address
provides a list of factory-set IRQs and I/O port addresses assigned.

Appendix D Installing Windows Server 2003 x64 Editions
describes how to install Microsoft Windows Server 2003 x64 Editions without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003 x64 Editions. See Chapter 5 for details.

Appendix E Installing Windows Server 2003
describes how to install Microsoft Windows Server 2003 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003. See Chapter 5 for details.

Appendix F Installing Windows 2000
describes how to install Microsoft Windows 2000 without using Express Setup. Using the Express Setup tool is recommended for installing Windows 2000. See Chapter 5 for details.

Appendix G Product Configuration Record Table
provides a table to be filled with your server configuration.

Text Conventions

The following conventions are used throughout this User's Guide. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT:	Items that are mandatory or require attention when using the server
NOTE:	Helpful and convenient piece of information

IN THE PACKAGE

The carton contains various accessories, as well as the server itself. See the packing list to make sure that you have everything and that individual components are not damaged. If you find any component missing or damaged, contact your sales agent.

- Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot the server, as well as to set it up.
- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.
- Improper use of any provided floppy disk or CD-ROM may alter your system environment. If you find anything unclear, immediately ask your sales agent for help.

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Chapter 1

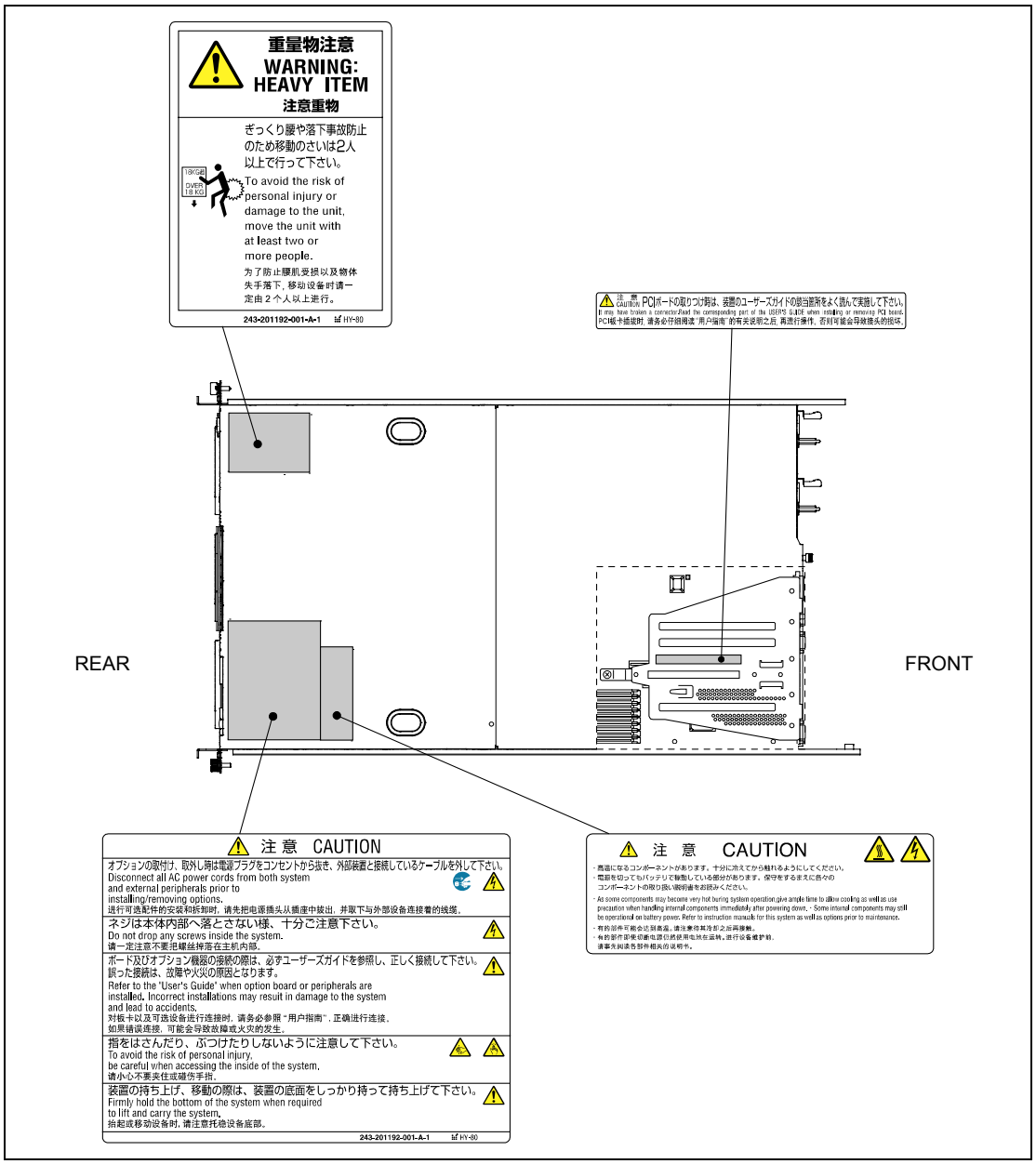
Notes on Using Your Server

This chapter includes information necessary for proper and safe operation of the server.

WARNING LABELS

The warning label is attached to components with possible danger or their vicinity in your server to inform the user that a hazardous situation may arise when operating the server. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your sales representative.


重量物注意
WARNING:
HEAVY ITEM
注意重物
ぎっくり腰や落下事故防止のため移動のさいは2人以上で行って下さい。
To avoid the risk of personal injury or damage to the unit, move the unit with at least two or more people.
为了防止腰肌受损以及物体失手落下，移动设备时请一定由２个人以上进行。
243-201192-001-A-1
REAR
FRONT
注 意 CAUTION
オプションの取付け、取外し時は電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。
Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.
进行可选配件的安装和拆卸时，请先把电源插头从插座中拔出，并取下与外部设备连接着的线缆。
ネジは本体内部へ落とさない様、十分ご注意下さい。
Do not drop any screws inside the system.
请一定注意不要把螺丝掉落在主机内部。
ボード及びオプション機器の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。誤った接続は、故障や火災の原因となります。
Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.
对板卡以及可选设备进行连接时，请务必参照“用户指南”，正确进行连接。如果错误连接，可能会导致故障或火灾的发生。
指をはさんだり、ぶつけたりしないように注意して下さい。
To avoid the risk of personal injury, be careful when accessing the inside of the system.
请小心不要夹住或碰伤手指。
装置の持ち上げ、移動の際は、装置の底面をしっかり持って持ち上げて下さい。
Firmly hold the bottom of the system when required to lift and carry the system.
抬起或移动设备时，请注意托稳设备底部。
243-201192-001-A-1
注 意 CAUTION
- 高温になるコンポーネントがあります。十分に冷えてから触れるようにしてください。
- 電源を切ってもバッテリで駆動している部分があります。保守をするまえに各々のコンポーネントの取り扱い説明書をお読みください。
- As some components may become very hot during system operation,give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down. - Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.
- 有的部件可能会达到高温，请注意待其冷却之后再接触。
- 有的部件即使切断电源但依然使用电池在运转，进行设备维护前，请事先阅读各部件相关的说明书。

SAFETY NOTES

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, see "SAFETY INDICATIONS" provided earlier.

General

⚠ WARNING

Do not use the server for services where critical high availability may directly affect human lives.

Your server is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the POWER switch and disconnect the power plug from the outlet, then contact your service representative. Using the server in such conditions may cause a fire.

Keep needles or metal objects away from the server.

Do not insert needles or metal objects into ventilation holes in the server or openings in the floppy disk or CD-ROM drive. Doing so may cause an electric shock.

Do not use the server in any unapproved place.

Install the server on a standard EIA 19-inch rack assembly. Do not install the rack containing the server in a place inappropriate to the rack installation environment.
Failure to follow these instructions may cause some bad influences to be imposed on the server and other systems installed on the rack and also a fire or personal injury due to falling of the rack may occur. For the detailed explanation on the place where the server should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact you service representative.

Always install the server on a rack conforming to the relevant standard.

Install the server on a rack confirming to the EIA standard for the server to be used. Do not use the server with installed on any other rack than standard EIA 19-inch rack or without the installation on a proper rack. Failure to follow these instructions may cause the server to operate incorrectly and/or personal injury or damages of surrounding devices to occur. Contact your service representative for the racks available for the server.

⚠ CAUTION

Keep water or foreign matter away from the server.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the server. Failure to follow this warning may cause an electric shock, a fire, or a failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server. Contact your service representative.

Power Supply and Power Cord Use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.
Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of the server may heat up the cord and cause a fire.

Do not connect the power cord to an outlet that has an illegal number of connections.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Use the authorized power cord only.

Use only the power cord that comes with your server. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow. Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

- Do not stretch the cord harness.
- Do not pinch the power cord.
- Do not bend the power cord.
- Keep chemicals away from the power cord.
- Do not twist the power cord.
- Do not place any object on the power cord.
- Do not bundle power cords.
- Do not alter, modify, or repair the power cord.
- Do not secure the power cord with staples or equivalents.
- Do not use any damaged power cord. (Replace a damaged power cord with a new one of the same specifications. Ask your service representative for replacement.)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Rack

CAUTION

Do not carry or install the server only by a single person.

More than one person is required to carry or install the rack. Failure to follow this instruction may cause the rack to fall to result in personal injury and/or breakages of surrounding devices. In particular, a high rack (such as 44U rack) is unstable if it is not fixed by stabilizers. More than one person must always carry or install the rack while they support it.

Do not install the server so that the load may be concentrated on a specific point.

Install stabilizers on the rack so that the total load of the rack and devices mounted on the rack is not concentrated on a singe point or join more than one rack with each other to distribute the load. Failure to follow this instruction may cause the rack to fall to result in personal injury.

Do not install components on the server only by a single person.

More than one person is required to install parts including the doors and trays for the rack. Failure to follow this instruction may cause some parts to fall to be broken and/or to result in personal injury.

Do not pull out a device from the rack if the rack is unstable.

Always pull out a device from the rack in the state that the rack is made stable (by the installation of stabilizers or earthquake-resistant construction).

Do not leave more than one device being pulled out from the rack.

Pulling out more than one device from the rack may cause the rack to be fallen. Only pull out a single device from the rack at a time.

Do not provide the wiring for the server to exceed the rating of the power supply.

To prevent burns, fires, and device damages, the power supplied to the power supply in the rack shall not exceed the rating load of the power branch circuit. Contact your electric constructor or the local power company for the requirements on the wiring and installation of electric facilities.

Installation, Relocation, Storage, and Connection

⚠ WARNING

Disconnect the power cord(s) before installing or removing the server.

Make sure to power off the server and disconnect the power cord(s) from a power outlet before installing/removing the server. All voltage is removed only when the power cords are unplugged.

⚠ CAUTION

Never attempt to lift the server only by yourself.

The server weighs max. 20 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back. Hold the server firmly by its bottom with another person to carry it. Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place

Do not install the server on a rack with leaving covers removed.

Do not install the server on a rack with the cover being removed. Failure to follow this instruction may reduce the cooling effect in the server to result in some malfunction and/or dusts to enter the server to result in a fire or electric shock.

Do not pinch your finger with rails or other components.

Note sufficiently that your fingers may not be caught between a rail and another mechanical part or cut by a rail at installation or removal of the server from the rack.

Do not apply any load on the server pulled out from the rack.

Do not apply any load on the server pulled out from the rack. Doing so bends the frame of the server. Consequently, the server cannot be pushed back into the rack. Placing an object on the server may also cause personal injury if the server drops.

⚠ CAUTION

Do not connect any interface cable with the power cord of the server plugged to a power source.

Make sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire. Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.

Cleaning and Working with Internal Devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion other than described in this User's Guide. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

Do not look into the CD-ROM drive.

A laser beam is used in the CD-ROM drive. Do not look into or insert a mirror into the drive while the drive is powered. If a laser beam is caught in your eyes, you may lose your eyesight (the laser beam is invisible).

Do not remove the lithium battery.

The server contains the lithium battery. Do not remove the battery. Placing the lithium close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your service representative. Do not disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before cleaning the server.

Make sure to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.

Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION

Avoid installation in extreme temperature conditions.

Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.

Make sure to complete board installation.

Always install a board firmly. An incompletely installed board may cause a contact failure, resulting in smoking or fire.

During Operation

⚠ CAUTION

Do not pull out or remove the server from the rack unnecessarily.

Do not pull out or remove the server from the rack unnecessarily. Pulling out or removing the server from the rack may cause not only the server to operate incorrectly but also the server to fall on people to make them injured.

Stay away from the fan.

Keep your hand or hair away from the cooling fan on the rear of the server. Failure to follow this warning may get your hand or hair caught in the fan, resulting in injury.

Avoid contact with the server during thunderstorms.

Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server including the cables. Failure to follow this warning may cause a fire or an electric shock.

Keep animals away from the server.

Failure to follow this warning may cause a fire or an electric shock.

Do not place any object on top of the server.

The server may fall and cause property damage to the surroundings.

Do not leave the server with its CD-ROM tray ejected.

Dust may enter the server through openings and cause malfunctions of the server. Any person may also bump it and get injured.

Do not use a cellular phone or pager around the server.

Turn off the cellular phone or pager. Radio interference may cause malfunctions of the server.

FOR PROPER OPERATION

Observe the following notes for successful operation of the server. Use of the server ignoring the notes will cause malfunctions or failures of the server.

- Install the rack assembly in a place that meets requirements for successful operation. For details, see Chapter 3, "Setting Up Your Server."
- The server is intended for installation in a Restricted Access Location, mounted above a non-combustible material.
- Do not delete the hard disk partition exclusively provided for maintenance of the server although it may appear on the OS.
- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.
- Verify that the access LED on the server is unlit before turning off the server or ejecting the floppy disk.
- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience 10 seconds delay from the time you press the POWER switch on the front panel. This is normal system operation and is required by the server management logic.
- Do not turn off the server until the POST (Power On Self-Test) completes. See Chapter 2 for details of POST.
- When you have just turned off the server, wait at least 30 seconds before turning it back on.
- Turn off the power and unplug the power cord from the outlet before relocating the server.
- Clean the server on a regular basis. (See Chapter 7 for cleaning.) Regular cleaning proactively prevents various failures of the server.
- Lightning may cause a momentary voltage drop. To prevent this problem, it is recommended to use of an uninterruptible power supply unit.
- Check and adjust the system clock before the operation if any of the following conditions is applicable.
  - After carriage of device
  - After storage of device
  - After the device is entered into the pause state under the environmental condition enduring device operation (temperature: 10°C - 35°C, humidity: 20% - 80%)
- Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).
  If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your service representative to ask maintenance.
- Store the unit under the storage condition (temperature: –10°C - 55°C, humidity: 20% - 80%, without condensation) to allow built-in devices and the unit to operate correctly in the next operation.

- Make sure to use optional devices supported by the server. Some non-supported devices may be physically installed/connected but cause failures of the server as well as a malfunctions of the server.
- NEC recommends you use NEC's genuine products. Some third-party products claim that they support the server. However, repair of the server due to a failure or damage resulted from use of such third-party products will be charged.

TRANSFER TO THIRD PARTY

The following must be observed when you transfer (or sell) the server or software provided with the server to a third party:

Server

Make sure to provide this User's Guide along with the server to a third party.

Provided Software

To transfer or sell any software application that comes with the server to a third party, the following requirements must be satisfied:

- All provided software applications must be transferred and no backup copies must be retained.
- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
- Software applications that are not approved for transfer must be uninstalled before transferring the server.

DISPOSAL AND CONSUMABLES

- Dispose the server, all the internal devices, floppy disks, and CD-ROMs according to all national laws and regulations.

IMPORTANT: For disposal (or replacement) of the battery on the mother board of the server, consult with your service representative.

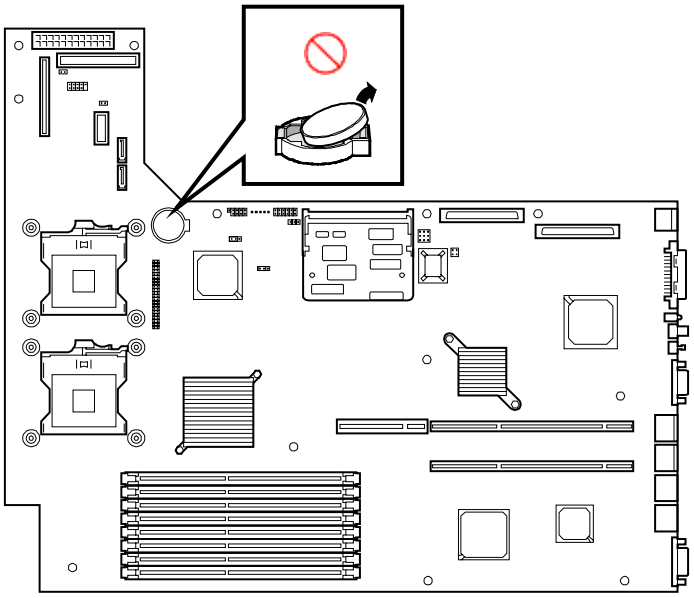
- The server contains some components that are only good for a limited period of time and require replacement, such as fans, internal batteries, the internal CD-ROM drive, the floppy disk drive, and the mouse. For stable operation of the server, NEC recommends you replace these components on a regular basis. Consult with your service representative for replacement or the product lives.

⚠ WARNING

Do not remove the lithium battery.

The server contains the lithium battery. Do not remove the battery. Placing the lithium or nickel cadmium battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your service representative. Do not disassemble the server to replace or recharge the battery by yourself.



Mother board

USER SUPPORT

Before Asking for Repair, do the following when the server appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.
2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the software required for operation of the server is properly installed.

If the server still appears to fail after you have taken the above actions, consult with your service representative immediately. Take notes on LED indications of the server and alarm indications on the display unit before consultation, which may provide a significant help to your sale agent.

Advice for Health

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture

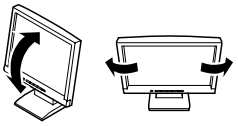
You have good posture if the following are satisfied when you use a computer:

- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

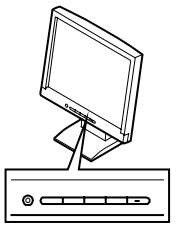
You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.

Adjustment of Display Unit Angles



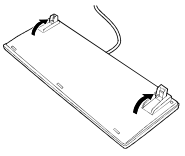
Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.

Adjustment of Screen Brightness and Contrast

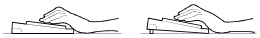


The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.

Adjustment of Keyboard Angle



The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



Cleaning of Equipment

Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest

If you feel tired, you should stop working and do light exercises.

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Chapter 2

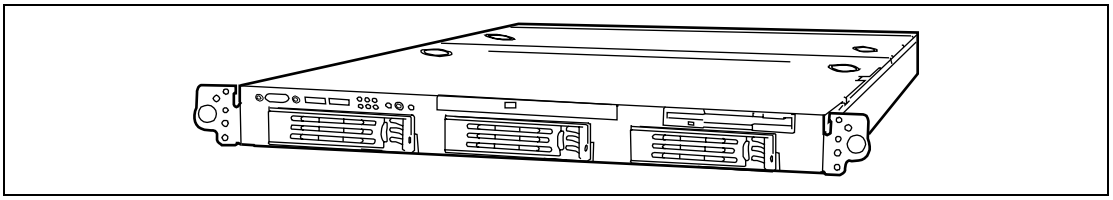
General Description

This chapter provides information that you should be familiar with before using the server. It includes names and functions of the components and features of the server.

OVERVIEW

Your server is a modular, multiprocessing server based on the Intel® Xeon® microprocessor. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

Your server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.

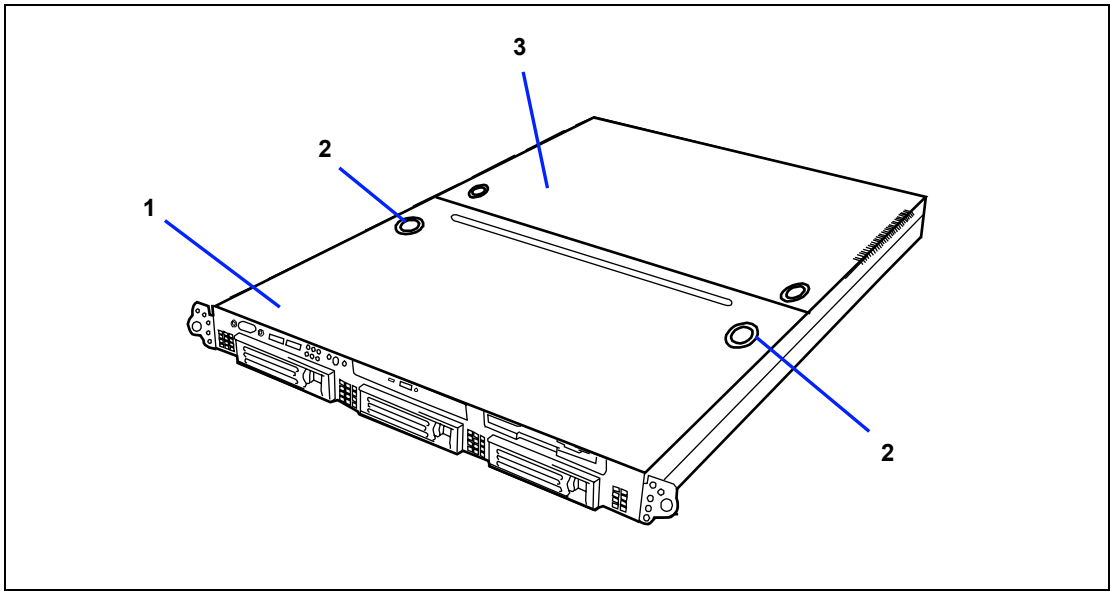


Your server includes a 3.5-inch diskette drive, a CD-ROM drive and three (SCSI) or two (SATA) hard disk drive bays. The hot-swap SCSI hard disk drive bays support up to three 1.0-inch SCSI hard disk drives that can be swapped in or out of the system without powering it down, if RAID functionality is configured in the system.

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices: tape devices, CD-ROM, and hard disk drives.

External View

The following figure shows the SCSI hot-plug hard disk drive model.



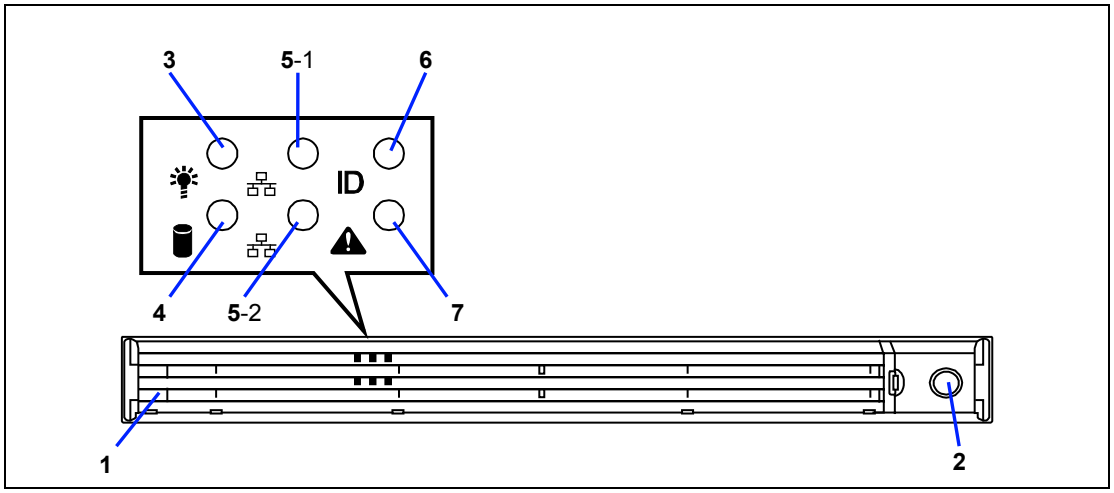
1 Drive cover

2 Release buttons

3 Logic cover

Front View with Front Bezel Closed

The following figure shows the location of the front system features.



1 Front bezel
The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover.

2 Key slot
Insert the security key into this slot when unlocking the front bezel.

3 POWER LED (green)
This LED turns green when the power is turned on.

4 DISK ACCESS LED (green/amber)
This LED is green during access to the internal hard disk drives. The LED turns amber when even one of the internal hard disk drives fails.

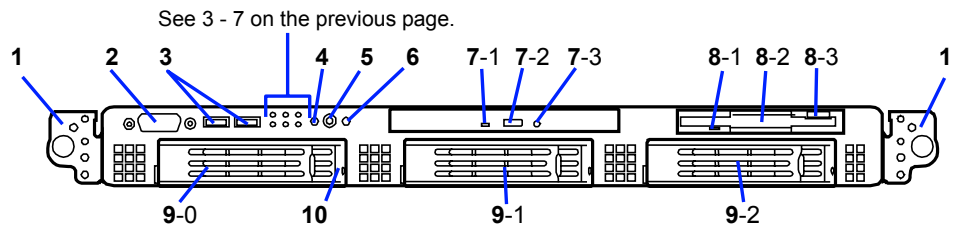
5 ACT LED (green)
This LED is on while the system is connected to the network. The number "1" on the icon indicates LAN port 1, and the number "2" indicates LAN port 2.

6 UID LED (blue)
This LED goes on when the UID switch is pressed. (The LED also goes on or flashes when software issues a command.)

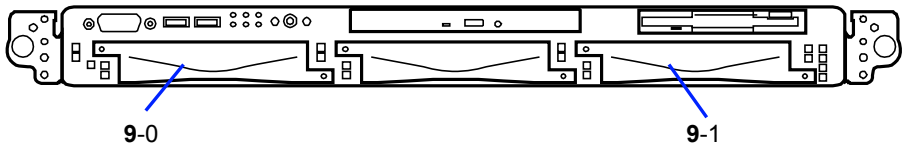
7 STATUS LED (green/amber) (on the front panel)
This LED indicates the server status. The LED is green during normal operation. The LED turns amber or flashes when the server enters the abnormal state.

Front View with Front Bezel Removed

Hot-plug SCSI hard disk drive model



SATA fixed hard disk drive model



1 **Handles (1 at the right and left each)**
Hold the handles when dismounting/mounting the server from/in the rack.

2 **Serial port B (COM B) connector**
Connect device having a serial interface to this connector (such as remote console PC).

3 **USB connectors (2 ports)**
Connect device compliant with the USB interface to the connectors.

4 **DUMP (NMI) switch**
Press this switch to dump system memory.

5 **POWER switch**
Press this switch to turn on/off the power. Pressing the switch once turns on the power, and the POWER LED goes on. Pressing it again turns off the power. Keep pressing the switch for 4 seconds or more forcibly turns off the power.

6 **UID (Unit ID) switch**
Press this switch to turn on/off the UID LEDs on the front and rear panels of the server. Pressing the switch once turns on the LEDs. Pressing it again turns them off.

7 **Optical disk drive (CD-ROM drive)**
This drive reads data from the CD-ROM.
7-1 Disk access LED **7**-2 CD tray eject button **7**-3 Emergency hole

8 **3.5-inch floppy disk drive**
This drive reads/writes data from/to the 3.5-inch floppy disk.
8-1 Disk access LED **8**-2 Disk slot **8**-3 Eject button

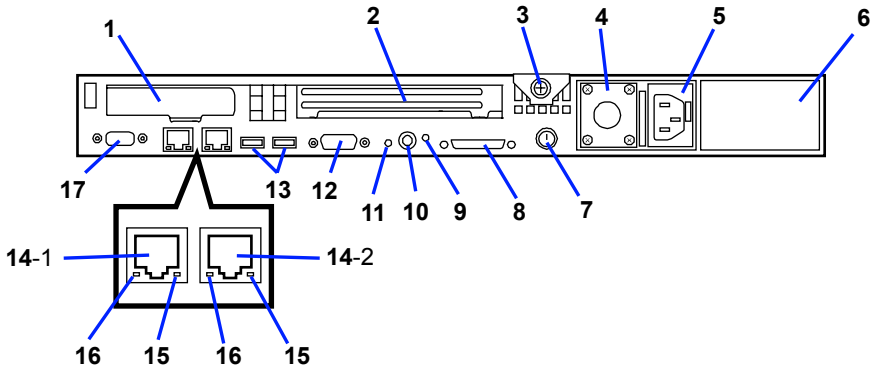
9 **Hard disk drive bays**
Mount SCSI hard disk drives in the bays. Each number following the bold-faced number indicates the SCSI ID. In the standard configuration, the hard disk drive trays are mounted in all the bays.

10 **DISK LED (green/amber)**
Hard disk drive LED. Each hard disk drive LED is green during access to the hard disk drive. The LED turns amber when the hard disk drive fails. The LED flashes switching back and forth between green and amber during build processing (in only disk array configuration).

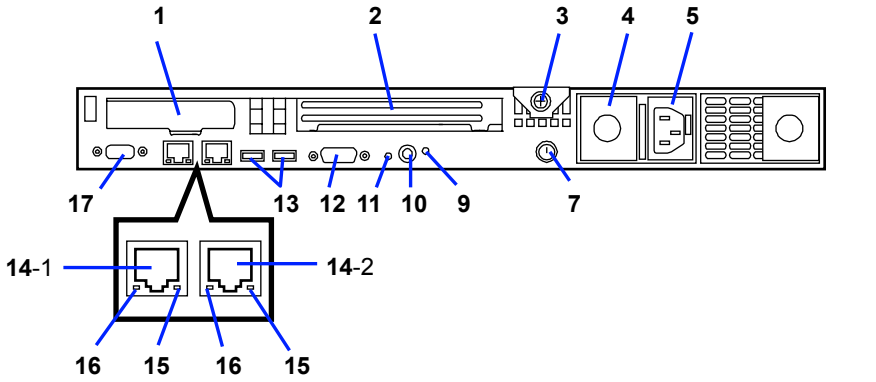
11 **SATA hard disk drive bays**
Mount SATA hard disk drives in the bay. The left side bay is connected to channel 1 of the SATA connector on the mother board. The right side bay is connected to channel 2 of the SATA connector on the mother board.

Rear View

SCSI hot-plug hard disk drive model



SATA fixed hard disk drive model



1 Low-profile PCI board extension slot
Mount PCI board of the low-profile type into this slot. The slot number is 1C.

2 Full-height PCI board extension slots
Mount PCI board of the full-height type in the slot. The slot number is 1B.

3 Captive thumbscrew
Secures the logic cover to the chassis.

4 Power supply
Supplies DC power to the server.

5 AC inlet
Connect the power cord to this socket.

6 Redundant power supply slot
Hot-swap SCSI hard disk drive model only.
An optional slot for 1+1 redundant power configuration.

7 Mouse/keyboard connectors
Connect the mouse and keyboard to the connectors through the provided relay cables.

8 SCSI connector
Hot-swap SCSI hard disk drive model only.
Connect external SCSI device to this connector.

9 UID LED (blue)
This LED goes on when the UID switch is pressed. (The LED also goes on when software issues a command.)

10 UID switch
Press this switch to turn on/off the UID LEDs on the front and rear panels of the server. Pressing the switch once turns on the LEDs. Pressing it again turns them off.

11 DUMP (NMI) switch
Press this switch to dump system memory.

12 Serial port A (COM A) connector
Connect device having a serial interface to this connector.
A leased line cannot be connected directly to this connector.

13 USB connector
Connect device compliant with the USB interface to this connector.

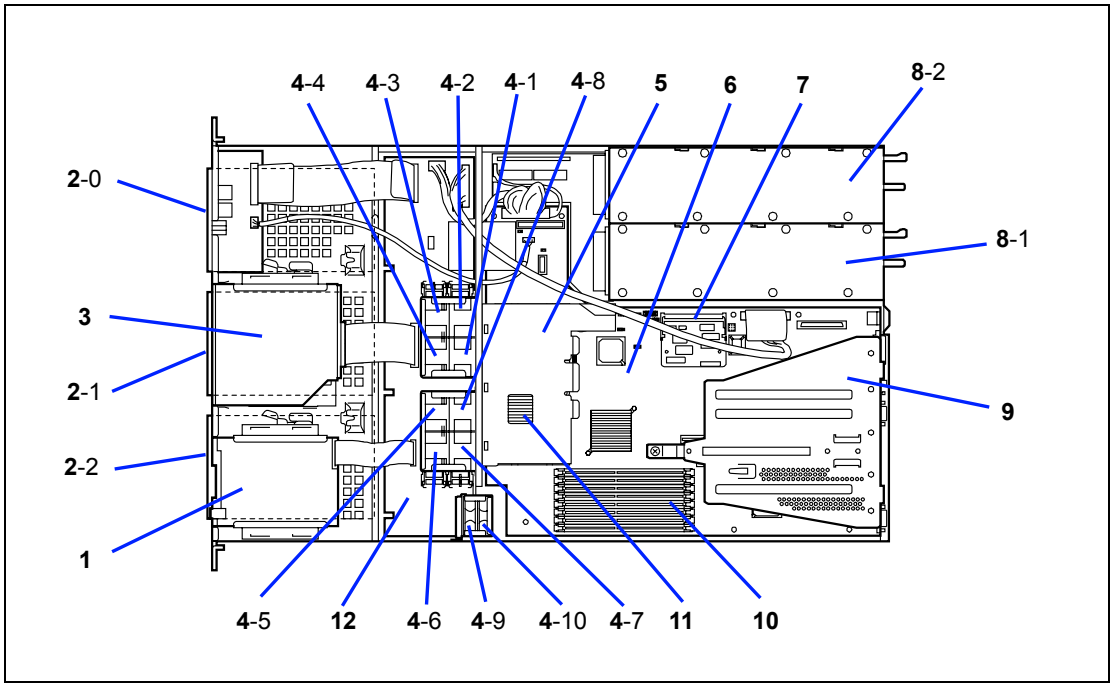
14 LAN connectors
Connect network systems on the LAN to the connectors.
The number "1" following the bold-faced number indicates LAN port 1, and the number "2" indicates LAN port 2.

15 Speed LED (amber)
This LED indicates the transmission speed of the LAN.

16 LINK/ACT LED (green)
This LED indicates the access status of the LAN.

17 Monitor connector
Connect the display unit to this connector.

Internal View



1 **CD-ROM drive**

2 **Disk bays**
(Each number following the bold-faced number indicates the channel number. Item 2-1 is used only for SCSI hot-plug hard disk drive model.)

3 **Floppy disk drive**

4 **Cooling fans**
(Each number following the bold-faced number indicates the fan number.)
Fans #3, #4, #5, #6, and #9 are redundant options for SCSI hot-plug hard disk drive model.

5 **Fan duct**

6 **Mother board**

7 **Remote Management Card**

8 **Power supply** (SATA fixed hard disk drive model)
8-1 Standard (SCSI hot-plug hard disk drive model)
8-2 Option (SCSI hot-plug hard disk drive model)

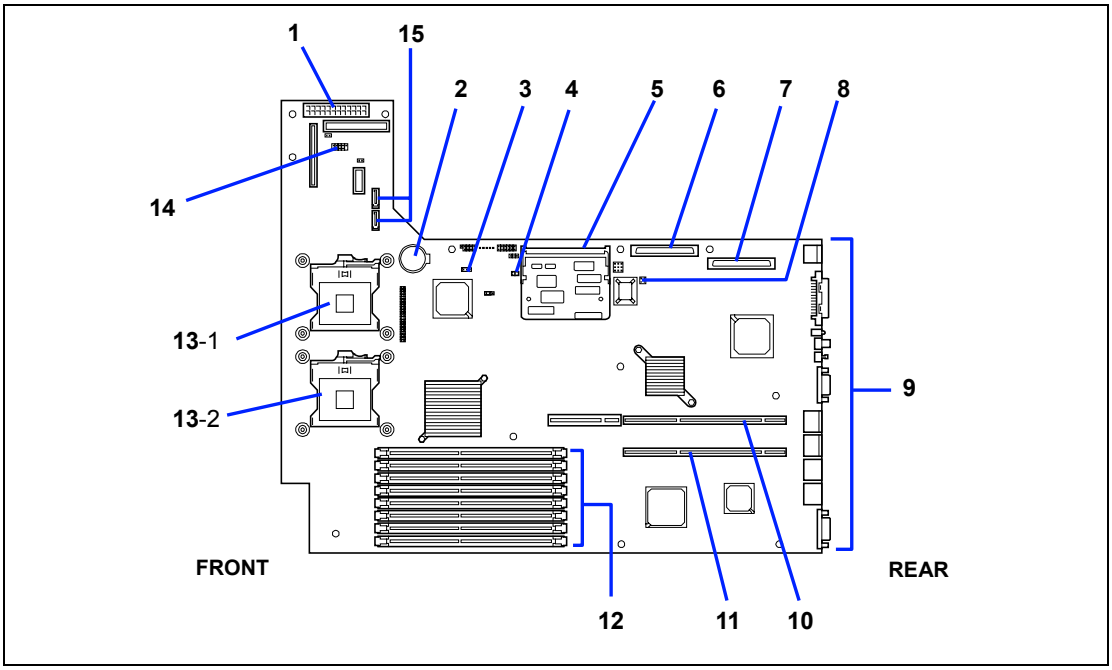
9 **Riser card assembly**

10 **DIMM**

11 **Processor** (mounted under the CPU and heat sink)

12 **Backplane**

Mother Board



1 Main power connector
2 Lithium battery
3 CMOS clear jumper switch
4 Hard disk drive access LED pin header
(Connect the LED relay cable of an additional SCSI/RAID controller.)
5 Remote management card socket
6 SCSI 2 connector (for SCSI hard disk drives)*1
(Exclusively used with connector of external SCSI device.)
7 SCSI 1 connector (not used in this system)*1
*1 SCSI hot-plug hard disk drive model only
8 Password clear jumper switch
9 Connectors for external device
10 PCI riser card slot
(For full-height boards. 133 MHz/64-bit, 3.3V, PCI-X)
11 PCI riser slot
(For only low-profile boards. 66MHz/64-bit, 3.3V, PCI-X)
12 DIMM sockets (for the interleave type)
(The sockets are called #1, #2, #3, #4, #5, #6, #7 and #8 sequentially from top.)
13 Processor sockets
13-1 Processor #1 (CPU #1) **13**-2 Processor #2 (CPU #2)
14 Redundant fan jumper switch
15 SATA connector

STATUS INDICATORS

This section explains the indication and meanings of the server LEDs.

POWER LED ( )

The POWER LED is on (green) while the server power switch is on. It is off while no power is supplied to the server.

The POWER LED indicates that the server is running in the power-saving mode (sleep mode). If the OS supports the power-saving mode such as Windows 2000, running the command blinks the POWER LED in green and place the server in the power-saving mode. Press the POWER switch to turn out the POWER LED and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

STATUS LED ()

The STATUS LED is on (green) while the server is operating normally. (The rear panel also has the STATUS LED on it.) If the STATUS LED is off or turns amber and flashes, it indicates that the server is in abnormal state.

The table below explains the STATUS LED indication, the meanings, and the procedures.

NOTES:

- If NEC ESMPRO or the offline maintenance utility is installed, you can confirm the cause of a failure by referring to the error log.
- If shutdown processing can be performed through the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by resetting, forcibly turning the power off, or disconnecting and then connecting the power cord.

STATUS LED indication	Description	Procedure
On (green)	The server is operating normally.	–
Flashing (green)	• The server is operating with the memory or CPU in degraded state. • An uncorrectable memory error has often occurred.	Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off*	The power is off.	–
	POST is in progress.	Wait for a while. The STATUS LED turns green when POST is completed.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your sales representative.
	A CPU temperature alarm was detected. (IERR)	
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
	A memory dump request is made.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	The power supply units failed.	
Flashing (amber)	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A voltage warning was detected	Contact your service representative.

DISK ACCESS LED ( )

The DISK ACCESS LED indicates the status of the hard disk drive mounted in the 3.5-inch disk bay.

The LED turns green each time access is made to the hard disk drive.

When the DISK ACCESS LED turns amber, it indicates that a hard disk drive failure has occurred. Check the hard disk drive LED for the status of the failing hard disk drive.

> **IMPORTANT:** If a hard disk drive in the server is connected to the internal disk array controller (which is additionally mounted), the access LED signal cable (connected to the connector on the mother board) must be connected from the disk array controller to the mother board.

ACT LED ( )

The ACT LED is green while the server is connected to the LAN. The LED flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.

UID LED (UID)

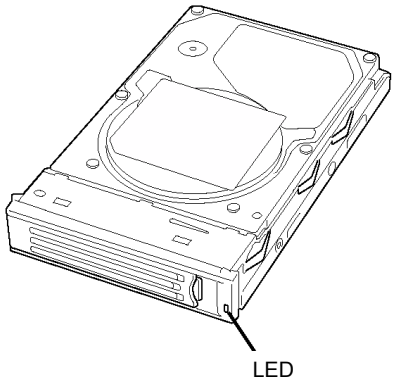
Pressing the UID switch toggles the front panel UID LED (blue) and the mother board UID LED on and off. The mother board UID LED is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of the servers on a rack.

Disk Access LED

The disk access LED of the floppy disk drive or CD-ROM drive is on while the drive is accessed.

Hard Disk Drive LED (SCSI hot-plug HDD model only)

The disk LED mounted in the 3.5-inch disk bay indicates the following depending on the status:



- Flashing (green)

  The LED indicates that the hard disk drive is accessed.

- On (amber)

  The LED indicates a failure of a hard disk drive mounted in disk array configuration.

  NOTE: Even if one of the hard disk drives fails in disk array configuration (RAID1 or RAID5), the server can continue operation. However, replace the disk as soon as possible, and perform reconstruction (rebuild) processing. (The failing disk can be replaced in hot swap mode.)

- Flashing switching back and forth between green and amber

  The LED indicates that reconstruction (rebuild) processing is being performed for the hard disk drive. (This flashing does not indicate a failure.) When a failing hard disk drive is replaced in disk array configuration, the system automatically rebuilds the data. (Auto-rebuild function) The LED switches back and forth between green and amber during rebuild processing.

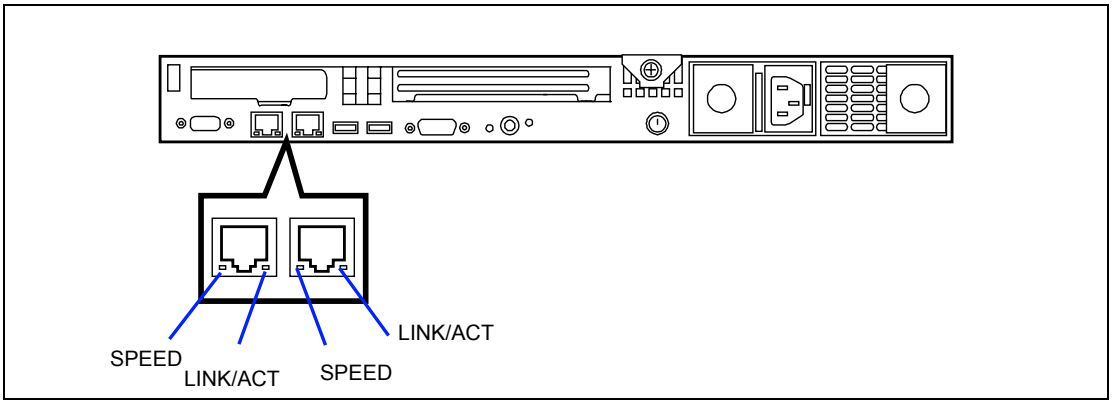
  The LED goes off when the rebuild processing has terminated. It turns amber when the rebuild processing fails.

IMPORTANT: If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk drive in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

- Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
- Let 90 seconds or more pass between when dismounting a failing hard disk drive and when mounting the new one.
- Do not replace a failing hard disk drive while rebuild processing is being performed for another hard disk drive.

LAN Connector LEDs

There are two LEDs for each of the two LAN ports (connectors) on the rear panel.



- LINK/ACT LEDs

  Each LINK/ACT LED indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the LED is on (green). The LED turns green and flashes while the network port is transmitting/receiving data.

  If the LED does not go on when the LINK state is placed, check if the network cable is in normal state and if it is connected correctly. If the LED does not go on yet when the network cable is normal, the network (LAN) controller may be faulty. In this case, contact your sales representative.

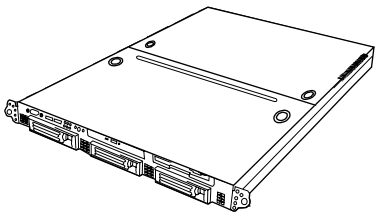
- Speed LED

  This LED indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 1000BASE-T. If the LED is lit green, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

STANDARD FEATURES

High performance

- Intel® Xeon® processor
- High-speed network interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (Ultra320 SCSI or SATA)
- High-speed memory access (DDR2-400)



Expandability

- One 64-bit/133MHz PCI-X and one 64-bit/66MHz PCI-X
- Large memory of up to 16 GB
- Three hot-swap SCSI hard disk drive bays*1
- Up to two multi-processors are available for upgrade.
- USB interface (A USB-support driver is required.)
- Two network ports

High-reliability

- Memory monitoring feature (error correction/error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Memory chip kill
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Auto-rebuild feature (optional, hot-swappable)
- BIOS password feature
- Mechanical security lock
- Onboard RAID controller
- Redundant fans (option)
- Redundant power supply
- Remote Management Card (RMC)

Many Available Features

- Graphic accelerator "RADEON 7000" support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-Link feature
- Consoleless feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D)

Management Utilities

- NEC ESMPRO
- NEC DianaScope

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

Easy and Fine Setup

- NEC EXPRESSBUILDER (system setup utility)
- Configuration Parameter Diskette Creator
- SETUP (BIOS setup utility)
- SCSI*Select* (SCSI device RAID configuration*1 utility)
- Array configuration*2

*1 SCSI hot-plug hard disk drive model
*2 SATA fixed hard disk drive model

Power Supply

The SCSI hot-plug hard disk drive model contains one auto-sensing 465-watt power supply at an operating frequency of 50/60Hz.

A second optional power supply may be added as part of a fault-tolerant hot-swap design. With two power supplies installed, in the unlikely event of a power supply failure, the load is transferred to the remaining power supply without interruption to normal operation. In this case the faulty power supply can be replaced without powering down the system.

> **NOTE:** The power supplies are not hot-swappable unless there are two power supplies installed.

The power supply for SATA fixed hard disk drive model is rated for 425 watts of power at an operating frequency of 50/60Hz.

The power subsystem supports implementation of remote management features including remote enable that permits power to be activated from a variety of sources.

Peripheral Bays

Your server supports a variety of standard PC AT-compatible peripheral devices. The chassis includes these peripheral bays:

- A 3.5-inch front panel bay for mounting the standard 3.5-inch diskette drive (supports 720 KB and 1.44 MB diskette media)
- A standard CD-ROM drive bay
- Three hot-swap SCSI hard disk drive bays or two SATA hard disk drive bays for mounting hard disk drives installed in easily removable drive carriers.

> **NOTE:** The hot-swap SCSI hard disk drive bays contain a hot-swap back plane that require an 80-pin single connector attachment (SCA) connector on the drives that you install.

System Cooling

The chassis includes a fan module with five fans for cooling the processor(s), hard drives, and PCI cards. The fan system is located in the middle of the chassis to pull cooling air through the chassis. The power supply contains two built-in fans for cooling.

The SCSI hot-plug hard disk drive model can include five optional redundant fans.

SAF-TE LOGIC

> **NOTE:** SAF-TE Logic is in systems that include the hot-swap SCSI disk drive cage. SAF-TE Logic is not available in systems that include the standard SCSI disk drive cage.

The SCSI backplane includes SAF-TE (SCSI Accessed Fault Tolerant Enclosure) logic that provides an interface to the disk subsystem that supports status signals, hot swapping drives, and enclosure monitoring.

The transport mechanism for the standardized alert detection and status reporting is the SCSI bus. Disk drives, power supplies, cooling fans, and temperature are continually monitored and the conditions then reported over the SCSI bus to the system. When used with RAID management software the user can be alerted of impending or imminent disk conditions requiring attention. This allows the user to react to conditions that could normally go unnoticed until data loss.

SYSTEM BOARD FEATURES

The following subsections describe the system board major components.

Processor

The system board accommodates one or two 64-bit Intel® Xeon® processors with 1MB/2MB cache in the FC-mPGA4 socket package. This processor uses the 90 nano technology and offers advanced performance.

Memory

The system board contains six 240-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered SDRAM DIMMs (DDR2 400 compatible). Memory is two-way interleaved and partitioned in three groups. You may install a minimum of 1 GB (512 MB × 2) and as much as 16 GB.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

> **NOTE:** Use DIMMs that have been tested for compatibility with the server board.
> Contact your sales representative or dealer for a current list of approved memory modules.

PCI Riser Slots

The mother board has two PCI riser slots. Riser B provides the following features:

- Bus speed up to 133 MHz
- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for a 1-slot PCI riser card
- Support for both full length and low profile PCI cards

Riser C provides the following features:

- Bus speed up to 66MHz
- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for a 1-slot PCI riser card
- Support for only low profile PCI cards

Video

The mother board uses an ATI RADEON 7000 PCI graphics accelerator with 16 MB of video SDRAM. The embedded SVGA video subsystem supports:

- Resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The mother board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

SCSI Controller

The SCSI version of the server board includes an embedded Adaptec AIC-7902 controller providing dual Ultra320 Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVDs devices generally are terminated through a jumper or resistor pack on the device itself.

Network Controller

NOTE: To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

The mother board uses a dual-channel Ethernet Controller and supports 10Base-T/100Base-TX/1000Base-T network subsystems.

The network controller supports the following features:

- 64-bit, 100 MHz PCI-X interface
- Integrated IEEE 802.3 10Base-T, 100Base-TX, and 1000Base-T compatible PHY
- IEEE 820.3u auto-negotiation support
- Chained memory structure similar to the 82559, 82558, 82557 and 82596
- Full duplex support at both 10 Mbps, 100 Mbps, and 1000 Mbps operation
- Low power +3.3 V device

On the system board, NIC 1 can be used as both a network interface and server management interface.

Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. A Y-cable can be used if both a PS/2 mouse and keyboard are required at the same time.

ACPI

The mother board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 2.0 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The system board supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.
- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.

> **IMPORTANT:** The system is off only when the AC power cord is disconnected.

Remote Management Card (RMC)

Server management is concentrated in the Remote Management Card (RMC). The RMC and associated circuitry are powered from a 5V DC standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The RMC supports the NEC DianaScope, which allows remote server management through networks. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on NEC DianaScope may be found in the NEC EXPRESSBUILDER CD-ROM.

One major function of the RMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the RMC maintains the nonvolatile Sensor Data Records (SDRs), from which sensor information can be retrieved. The RMC provides an ISA host interface to SCR sensor information, so that software running on the server can poll and retrieve the server's current status.

The RMC performs the following:

- Monitors server board temperature and voltage*
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure*
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

*Also, NEC ESMPRO supports these features.

DEGRADATION FEATURE

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

> **NOTE:** The degradation feature is only available when at least two DIMMs or processors are installed.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility of the server, "SETUP." They may also be identified on the system that has the NEC ESMPRO installed.

REMOTE POWER-ON FEATURE (WAKE ON LAN)

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, use the BIOS setup utility, "SETUP." (See Chapter 4.)

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

AC-LINK FEATURE

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-Link feature can be enabled or disabled with the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

SYSTEM SECURITY

To help prevent unauthorized entry or use of the system, the system includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

Security with Mechanical Locks and Monitoring

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn). The bezel is now unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn). The bezel is now locked and cannot be opened.

Software Locks via the BIOS Setup Utility

The BIOS Setup Utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period – 1 to 120 minutes.
- Set and enable a supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

Using Passwords

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup.
- Must enter the user password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- May enter either password to exit secure mode.

Secure Mode

Configure and enable the secure boot mode by using the BIOS Setup. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the BIOS Setup and go to the Security Subsystem Group, menu. The table also refers to the Setup utility.

Software Security Features

Feature	Description
Secure mode	How to enter secure mode: • Setting and enabling passwords automatically places the system in secure mode. • If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period. When the system is in secure mode: The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered. At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode. If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time. To leave secure mode: Enter the correct password(s).
Disable writing to diskette	In secure mode, the server will not boot from or write to a diskette unless a password is entered. To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only.
Set a time out period so that keyboard and mouse input are not accepted. Also, screen can be blanked, and writes to diskette can be inhibited	Specify and enable an inactivity time out period of from 1 to 120 minutes. If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted. The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup). To resume activity: Enter the correct password(s).
Control access to using the BIOS Setup: set supervisor password	To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup. If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed. To disable a password, change it to a blank entry in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 4).

Feature	Description
Control access to the system other than BIOS Setup: set user password	To control access to using the system, set a user password and enable it through Setup. To disable a password, change it to a blank entry in the Change Password menu of the User Password Option menu found in the Security Subsystem Group. To clear the password if you cannot access Setup, change the Clear Password jumper (see Chapter 4).
Boot without keyboard	The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message.
Specify the boot sequence	The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the “Secure Boot Mode” option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input.

NEC EXPRESSBUILDER

The CD-ROM that comes with the server contains a setup utility called "NEC EXPRESSBUILDER."

The major functions of the NEC EXPRESSBUILDER are:

- To install the Operating System.
  "Express Setup" helps you to install the Windows Operating System. (See Chapter 5)
- To diagnose the system.
  NEC EXPRESSBUILDER includes the System Diagnostics to check your server. (See Chapter 6)
- To create a support disk.
  Use this function to create the support disks used to boot the utilities from the floppy disk, or the OEM floppy disk used for a manual installation of Windows. (See Chapter 6)
- To update the BIOS.
  Use this function to update the system BIOS or firmware of the server. (See Chapter 6)
- To update the Windows System*
  "Update Express5800 system" in Master Control Menu(Windows-based NEC EXPRESSBUILDER feature) updates the several resources of Microsoft Windows Server 2003, Microsoft Windows 2000. (See Chapter 6)
- To install the utilities.
  NEC EXPRESSBUILDER includes some management software for Windows (NEC ESMPRO, NEC DianaScope and so on) and maintenance utilities for DOS (System diagnostics, Off-line Maintenance Utility and so on).
  You can install the applications for Windows from Master Control Menu and install the utilities for DOS from Tools menu. (See Chapter 6)
- To read the online documents*
  You can refer to the online documents from Master Control Menu. (See Chapter 6)

  * These functions are available under the Windows system.

NOTE: Some features among those listed above can be used from the remote computer via cross cable (COM), or LAN. See Chapter 6 for details.

NEC ESMPRO

The NEC ESMPRO is server management software that runs on the operating system. The NEC ESMPRO includes the NEC ESMPRO Manager for the server monitoring terminal and the NEC ESMPRO Agent for the server.

> **NOTE:** For details of major functions of the NEC ESMPRO, system configuration and setups with the NEC ESMPRO, see Chapter 6. Available functions of the NEC ESMPRO depend on the operating system you install. Ask your service representative for details.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is used for maintenance and fault analysis of the server. This utility is usually used by the service representative.

Refer to Chapter 8 for details.

SYSTEM DIAGNOSTIC UTILITY

The system diagnostic utility contained in the NEC EXPRESSBUILDER is useful to detect hardware failures. See Chapter 7 for details.

NEC DianaScope

The NEC DianaScope is a software for the remote management of the NEC Express5800 series. The NEC DianaScope can control the managed server even if operating system is not running on the managed server.

See Chapter 6 and online document in the NEC EXPRESSBUILDER.

USING YOUR SERVER

This section describes basic operations of the server including how to use devices such as the floppy disk drive and the CD-ROM drive. See Appendix B for notes on using the floppy disk, CD-ROM, and accessories including the keyboard and the mouse.

Front Bezel

Remove the front bezel to power on/off the server, to access the floppy disk drive and CD-ROM drive, and to install/remove hard disk drives to the 3.5-inch disk bays.

IMPORTANT:

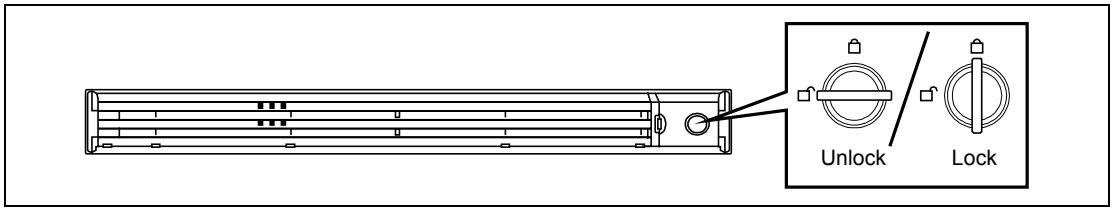
- To open the front door, you must unlock the door with the provided security key.
- Pay attention not to press the POWER switch when you install or remove the front bezel.

Installing or Removing the Front Bezel

When turning the power of the server on/off, accessing to the floppy disk drive or CD-ROM drive, or installing or removing a hard disk drive on or from the 3.5-inch disk bay, first remove the front bezel.

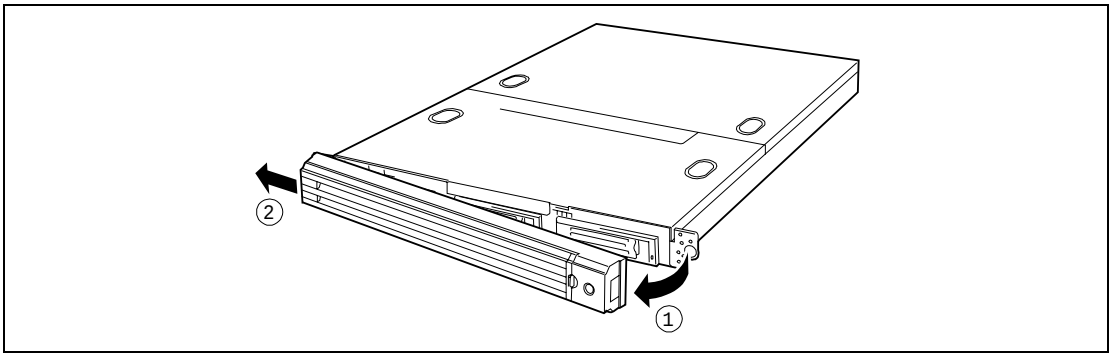
IMPORTANT: The front bezel can be opened only when you unlock it by using the attached security key.

1. Insert the attached security key into the key slot and turn the key to the front bezel side with it pressed lightly to release the lock.

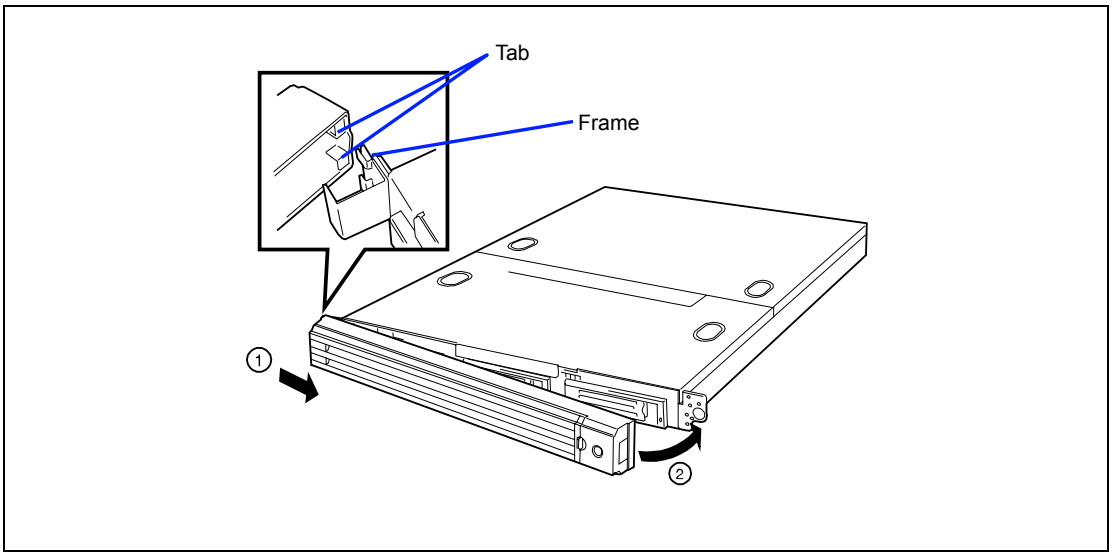


2. Hold the right end of the front bezel lightly to pull it toward you.

3. Slide the front bezel to the left a little to remove the tab from the frame and then remove the front bezel from the server.



To install the front bezel, latch the tab at the left side of the front bezel on the server frame. After the installation, lock the front bezel by using the key for security.



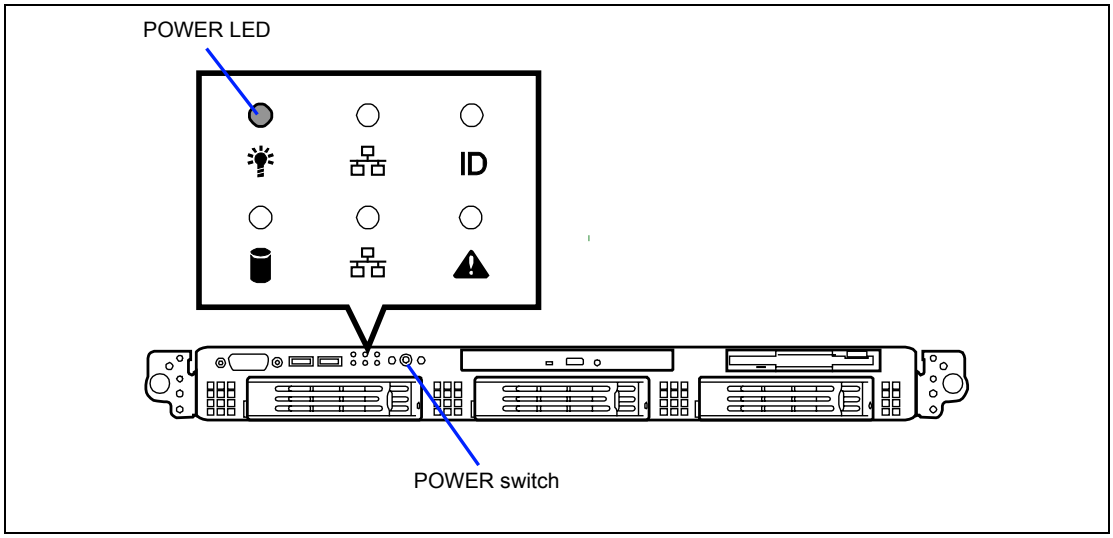
POWER Switch

Use the POWER switch to turn on/off the server.

Power On

Press the POWER switch on the front of the computer chassis.

The POWER LED lights in green.



IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptive Power Supply), make sure that the power control device is powered.
- If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis. Wait for about 10 seconds, then press the POWER switch.
- Always allow POST to complete before powering down your system.

POST

POST (Power On Self-Test) is the self-diagnostic program stored in the system memory.

When you power on the server, the system automatically runs POST to check the mother board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages of the BIOS setup utility, such as the start-up message, while in progress.

With the factory setup of the server, the NEC logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

> **NOTE:** You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diag Screen" under the Advanced menu of the BIOS SETUP utility.

The POST check results should be checked in the following cases.

- When the server is used for the first time.
- When the server appears to fail.
- When the server beeps for many times between power-on and OS start-up.
- When an error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in the chronological order.

IMPORTANT:

- Do not make key entries or perform mouse operations while POST is in progress.
- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST. In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later.

1. After a few seconds from power-on, POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.
2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.
3. POST then detects the internal SCSI controller and display the message prompting you to launch the SCSI device utility. (Ignore the message. POST will automatically proceed a few seconds later.)

   ```
   Press <Ctrl> <A> for SCSISelect(TM) Utility!
   ```

   To launch the SCSI device utility, press **Ctrl** and **A**. See Chapter 4 for setup and parameters.

   You need to use the SCSI device utility in the following cases:

   – When new SCSI device is installed in a 5.25-inch device bay.

   – When an external SCSI device connection is changed.

   – When the internal SCSI device connection is changed.

   – When the internal hard disk drives are configured with HostRAID.

   The server automatically restarts POST all over again when you exit the SCSI device utility.

   If more than one SCSI controller board is installed on the PCI bus of the server, the system detects the boot devices in order of the PCI slots 1C and 1B.

4. POST displays SCSI ID numbers used by the connected SCSI devices on the screen.

5. After a few seconds, POST displays the following message prompting you to launch the BIOS setup utility, SETUP, stored in the system memory of the server. This message appears at bottom left on the screen.

   ```
   Press <F2> to enter SETUP
   ```

   Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

   To launch the SETUP utility, press **F2** while the above message is displayed. See Chapter 4 for setup and parameters.

   The server automatically restarts POST all over again when you exit the SETUP utility.

6. If your server uses onboard serial ATA (SATA) RAID feature, the following message is displayed on the screen to prompt you to run Array Configuration Utility (ARC).

   ```
   Press <Ctrl><A> for Adaptec RAID Configuration Utility
   ```

   Press **Ctrl** + **A** to run ARC. For detail explanation, see Chapter 4.

7. If the server has an optional RAID controller installed, POST displays the message prompting you to launch the RAID configuration utility and the RAID BIOS setup utility.

   Refer to the manual supplied with the RAID controller for detail instructions.

   POST will automatically proceed a few seconds later.

8. If you set a password using the BIOS setup utility, SETUP, the password entry screen appears upon successful completion of POST.

   Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

   IMPORTANT: Do not set a password before installing an OS.

9. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. See Chapter 8 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

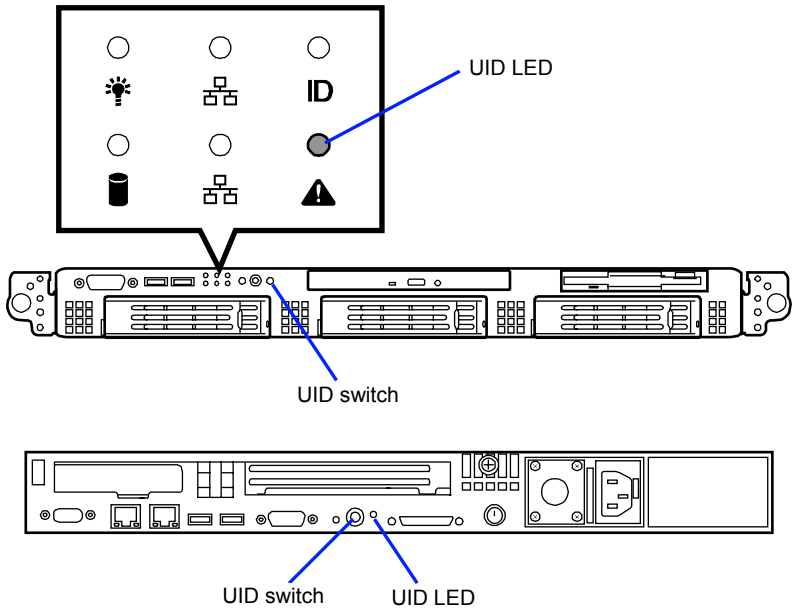
1. Shutdown the OS.
2. Press the POWER switch on the front of the server.
   The POWER LED goes off.
3. Power off peripheral devices.

Identification of Servers ~ UID Switch ~

An "UID (Unit ID) LED" is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the LED identifies the server you are going to maintain.

The UID LED goes on when the UID (Unit ID) switch on the front panel is pressed. It goes off when the switch is pressed again.

Maintenance from the rear of the rack has to be carried out in a dark, narrow space. The interface cable of a server or power supply unit in normal state may be disconnected by accident in this situation. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.



Floppy Disk Drive

The server is provided with the 3.5-inch floppy disk drive on its front to write/read data to/from a floppy disk.

The server supports the following 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Store data of 720KB.

Make sure that the server is powered (the POWER LED is lit) before inserting a floppy disk into the floppy disk drive.

When you completely insert the floppy disk into the floppy disk drive, the drive clicks and the eject button on the floppy disk is slightly pushed out.

NOTES:

- When an unformatted floppy disk is inserted, the message notifying that date read is not available and the message prompting formatting are displayed. Refer to the manual that comes with the OS to format the floppy disk.
- If the floppy disk contains a system, powering on or restarting the server with the floppy disk inserted boots the system from the floppy disk.

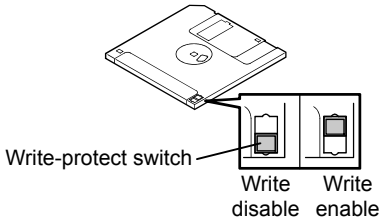
To eject the floppy disk from the floppy disk drive, press the eject button.

NOTE: Make sure that the floppy disk access LED is unlit before ejecting the floppy disk. Ejecting the disk when the access LED is lit may destroy the disk data.

NOTE: Use of the floppy disk

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Keep the floppy disk away from cigarette smoke.
- Keep the floppy disk away from any liquid (e.g., water) and chemicals.
- Keep the floppy disk away from any magnetic objects (e.g., magnet).
- Do not pinch the floppy disk with a paper clip or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.
- A floppy disk has a write-protect switch that prevents the stored data from accidental erasure. You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data. To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.



- The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis. (Make sure to make a back-up copy of every floppy disk provided with the server.)

CD-ROM Drive

The server is provided with the CD-ROM drive on its front to read data from a CD-ROM (read-only compact disk). The CD-ROM provides larger and faster data read than the floppy disk.

⚠ CAUTION

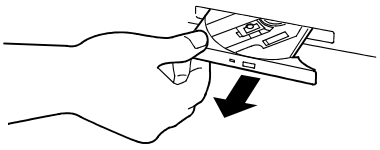
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not leave the tray ejected from the CD-ROM drive.

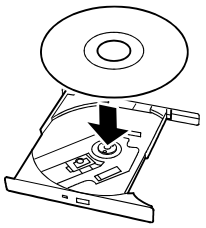
Set a CD-ROM on the CD-ROM drive in the following procedure.

1. Confirm that the power of the server is on (with the POWER LED being lit in green) before setting the CD-ROM on the CD-ROM drive.
2. Press the Eject button on the front of the CD-ROM drive.

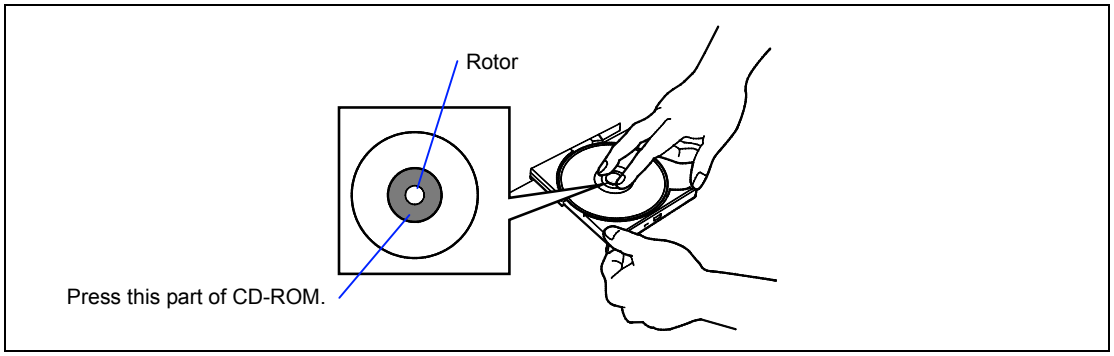
   The tray comes out a little.
3. Hold the tray lightly and pull it out toward you until the tray stops.



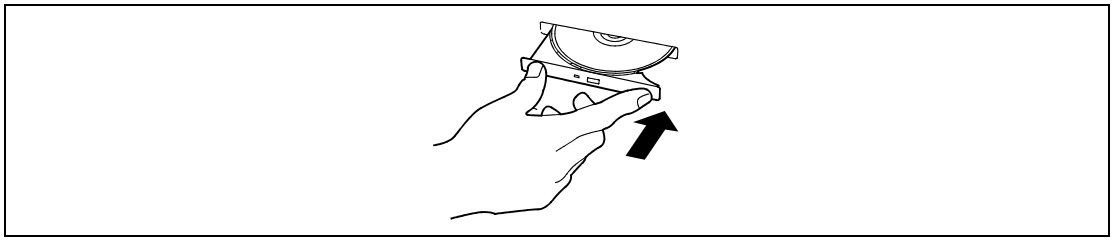
4. Put the CD-ROM on the tray carefully and securely with the character printed surface facing upward.



5. As shown in the figure below, hold the tray with a hand and press the CD-ROM with fingers of another hand to make the hole of the CD-ROM fit to the rotor at the center of the tray.

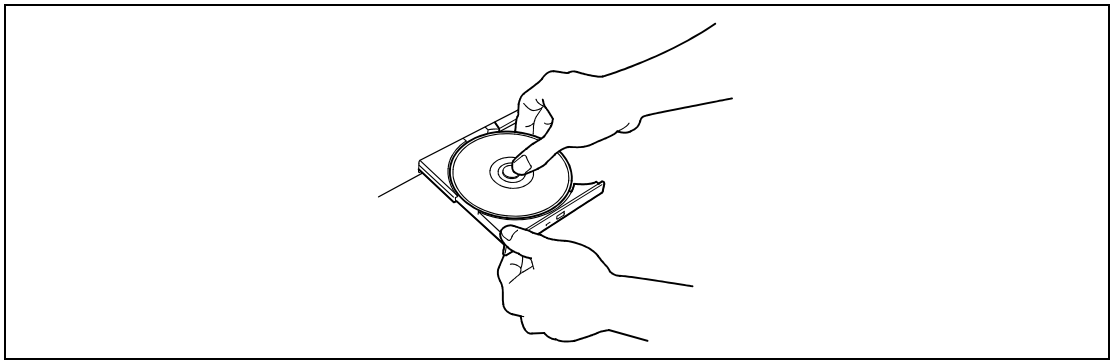


6. Push the front of the tray lightly to retract it into the drive.



IMPORTANT: If a noisy sound in driving the CD-ROM drive occurs after setting a CD-ROM, set it again correctly.

To take out the CD-ROM from the CD-ROM drive, press the Eject button in the similar way in setting the CD-ROM to make the tray go out.

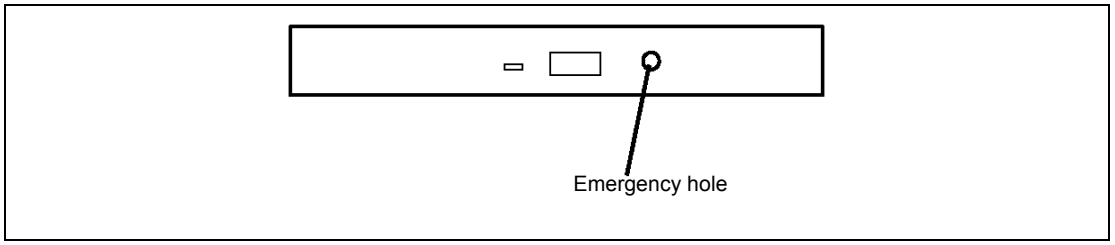


If the access LED is lit in orange, the CD is being accessed. Confirm that the access LED is not lit before pressing the Eject button.

As shown in the figure below, hold the tray with a hand and take the end of the CD-ROM lightly by the fingers of another hand with the suppression of the rotor at the center of the tray to remove the CD-ROM from the tray.

After taking out the CD-ROM, return the tray into the drive.

When you fail to eject the CD-ROM tray with the Eject button and take out the CD-ROM from the server, follow the procedure below.



1. Press the POWER switch to power off the server. (The POWER LED goes off.)
2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will make a substitute) into the emergency hole on the right front of the CD-ROM drive and gently push it in until the tray is ejected.

IMPORTANT:

- Do not use a toothpick or plastic stick that is easy to break.
- If the above procedure does not let you take out the CD-ROM, contact your service representative.

3. Hold the tray and pull it out.
4. Take out the CD-ROM.
5. Push the tray back into position.

NOTE: Use of the CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.
- Do not drop the CD-ROM.
- Do not place anything on the CD-ROM or bend the CD-ROM.
- Do not attach any label onto the CD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the CD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.
- Keep the CD-ROM away from cigarette smoke.
- Do not leave the CD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the CD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the CD-ROM in a CD-ROM case when not in use.
- If the CD-ROM emits large noise in the CD-ROM drive, remove the CD-ROM and insert it back again.

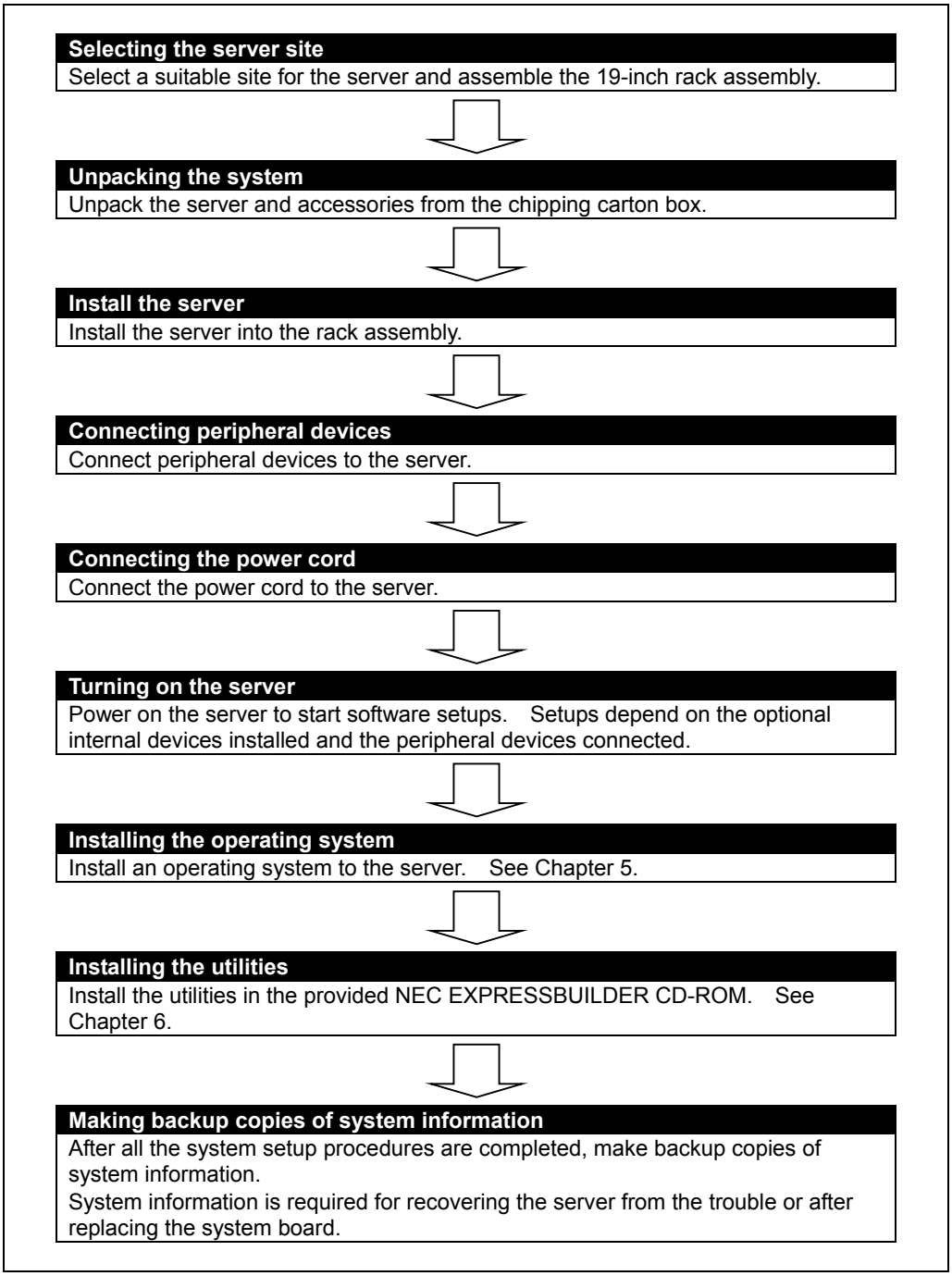
Chapter 3

Setting Up Your Server

This chapter describes how to set up the server appropriate for your system, on a step-by-step basis.

SETUP FLOW

Follow the flowchart below to set up the server.


Selecting the server site
Select a suitable site for the server and assemble the 19-inch rack assembly.
Unpacking the system
Unpack the server and accessories from the chipping carton box.
Install the server
Install the server into the rack assembly.
Connecting peripheral devices
Connect peripheral devices to the server.
Connecting the power cord
Connect the power cord to the server.
Turning on the server
Power on the server to start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.
Installing the operating system
Install an operating system to the server. See Chapter 5.
Installing the utilities
Install the utilities in the provided NEC EXPRESSBUILDER CD-ROM. See Chapter 6.
Making backup copies of system information
After all the system setup procedures are completed, make backup copies of system information.
System information is required for recovering the server from the trouble or after replacing the system board.

SELECTING SERVER SITE

To use the server, install it on a standard EIA 19-inch rack assembly.

Refer to the documentation attached to the rack or contact your service representative for the installation of the server on the rack.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not use the server in any unapproved place.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not carry or install the server only by a single person.
- Do not install the server where the load may be concentrated on a specific point.
- Do not install any component on the server only by a single person.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.
- Do not provide the wiring exceeding the rating power.

Do not install the rack in the places listed below. Installing the rack or mounting the server on the rack in such a place may cause some malfunction to occur.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gas is generated, chemicals are nearby, or chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your service representative for separate power cabling or noise filter installation.

UNPACKING THE SYSTEM

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

INSTALLING THE SERVER

This subsection provides the instructions for the rack-mount server unit into a standard EIA 19-inch rack cabinet.

Also this subsection describes the removal procedures for the rack-mount server unit from the 19-inch rack cabinet.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not use any rack which does not conform to the relevant standard.
- Disconnect the power cord(s) before installing or removing the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not leave more than one device being pulled out from the rack.
- Do not lift the server only by a single person.
- Always install the server in the specified place.
- Do not install the server on the rack leaving the cover removed.
- Do not pinch your finger with mechanical components.

Restricted Access Location

The server is intended for installation in a Restricted Access Location, mounted above a non-combustible material.

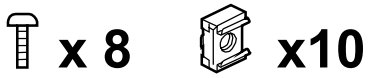
ESD Precaution

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Checking Components

Confirm that the following tools or components are provided to install the server on the rack.



M5 screw M5 core nut

Required Tools

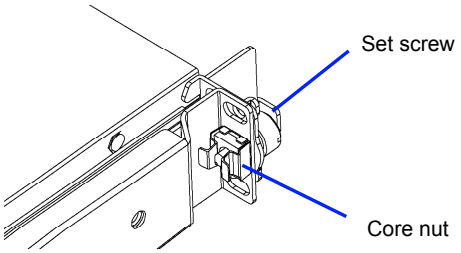
You may only prepare a Phillips screwdriver to install the server on the rack.

Installation Procedure for NEC Rack/Third Vendor's Rack

This server can be installed in either the NEC rack or a third vendor's rack. Take the following procedure to install the server in the rack:

Preparation before Installation

The slide rail is fixed with the screw to prevent from falling off during transportation. Remove the left and right core nuts from the front of the server before you install the server in the rack.



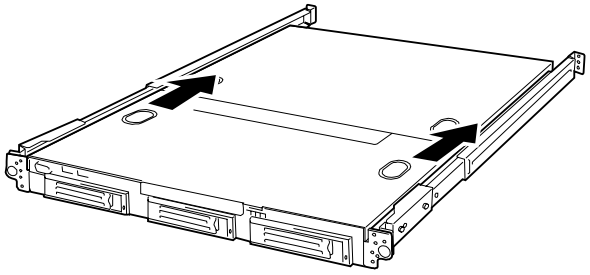
Hold the core nut, and rotate the set screw to remove the core nut.
Keep the removed core nuts for future use.

Removing the Rail Assemblies

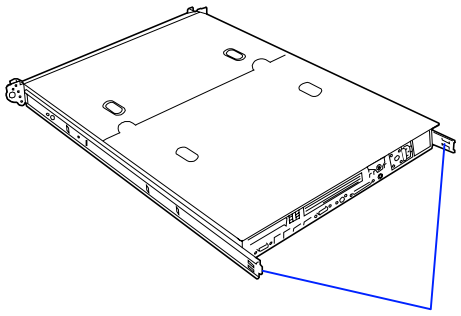
Remove the sliding rails from the server.

Hold the rails and slowly slides them toward the rear of the server until a "click" is heard. The click indicates that the rails are locked.

Push the release levers on the right and left sides of the server, and remove the rail assemblies from the server while unlocking.



Only the inner rails remain screwed to the server when the rail assemblies have been removed.

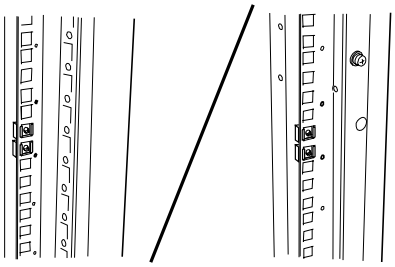


IMPORTANT: The removed rail assemblies are to be installed on the inner rails later. To install each rail assembly on the correct inner rail, make a mark on the assemblies. Similarly, when installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by making marks.

Installing the Core Nuts

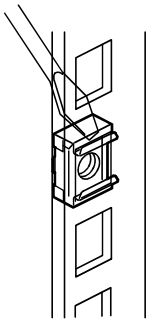
Install three core nuts on the front of the rack for each of the right and left sides and also two core nuts on the rear of the rack for each of the right and left sides.

Install three core nuts in 1U (the minimum unit of rack height). Three slots (angle holes) are opened per 1U of a rack. Install the core nuts at the three slots. (For any NEC rack, round marks are put in the unit of 1U.) For one core nut installed on the front of the rack, the lower nut is used to fix the front of the rail assembly, and the upper nut is used to support the set screw of the server. The core nuts installed on the rear of the rack are used to fix the rear of the rail assemblies.



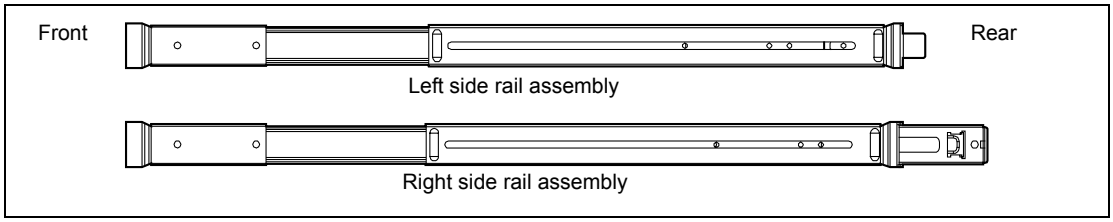
Hang either clip of a core nut on a square hole on the rack and insert another clip into the hole by using a tool such as a flat tip screwdriver.

NOTE: Confirm that all the core nuts are installed at the level.

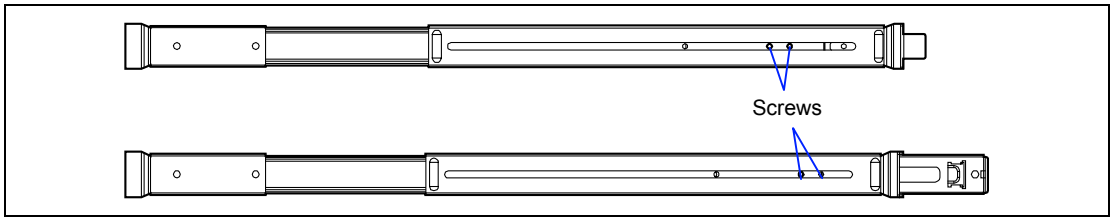


Installing the Rail Assemblies

Make sure of the right side rail assembly or the left one when installing it. See the figure below.



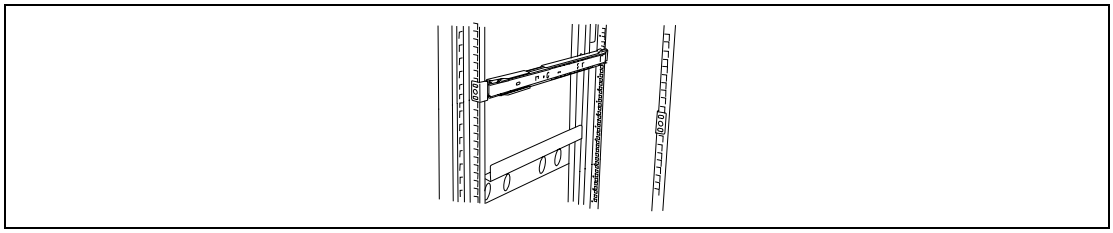
1. Loosen a screw securing the rail assembly.



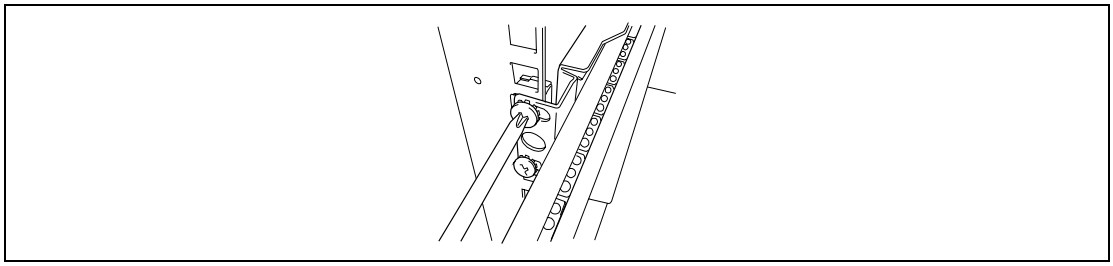
2. Align the front and rear frames of rail assembly to the location where the core nuts are installed.

Locate the rail assembly so that the frame of the rack is located between core nuts and frames of rail assembly.

> **NOTE:** Confirm that the portion of the frame to fix the rail assembly is located in front of the rack frame.



3. Firmly secure the rail assembly (one screw for the front of a rail, two screws for the rear of a rail).



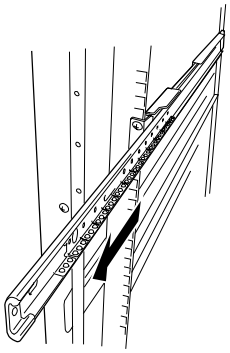
Installing the Server

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not lift the server only by a single person.
- Do not pinch your finger with mechanical components.

1. Pull out the sliding rails of the right and left rail assemblies until they are locked.

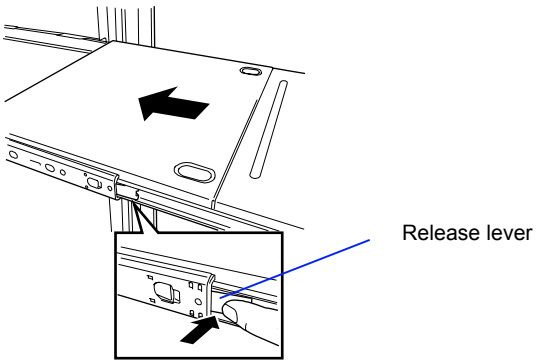


2. At least two persons are required to install the server. Securely hold the server and install it in the rack.

Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack, and then slowly push the server into the rack.

If the server is locked on its way into the rack, slowly push it in while pressing the release levers on the right and left sides of the server.

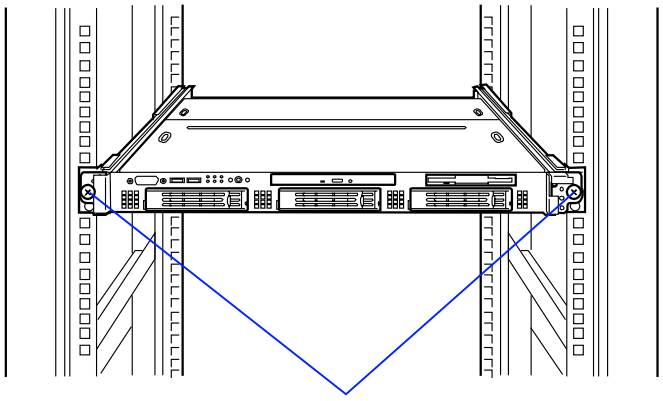
When the server is installed for the first time, the mechanical parts are rather hard to slide. You may feel strong friction when pushing in the server. In this case, strongly push it in.



3. Confirm that the sliding rails work normally by pulling the server out of the rack and pushing it in several times.

> **NOTE:** Confirm that the sliding rails work normally. If the sliding rails are stuck to the rack frame and do not come out, reinstall them.

Securing the Server



1. Push the server into the rack as far as it will go.
2. Tighten the right and left captive thumb screws on the front panel to secure the server to the rack.
3. Install the front bezel.

This completes the installing of the server.

Removing the Server from the Rack Assembly

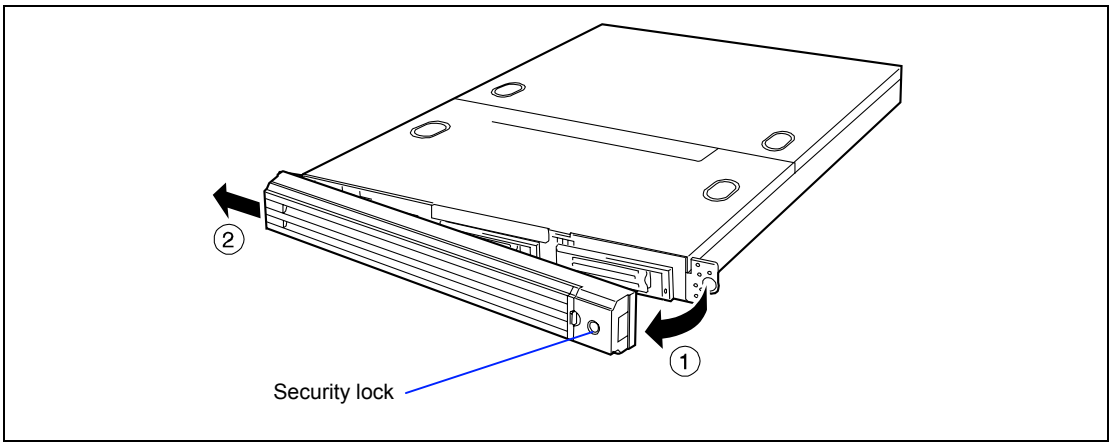
The server should be removed from the rack by at least two persons.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not lift the server only by a single person.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. Release the security lock to remove the front bezel.



2. Confirm that the power of the server is OFF, and disconnect the power cable and all the interface cables connected to the server.

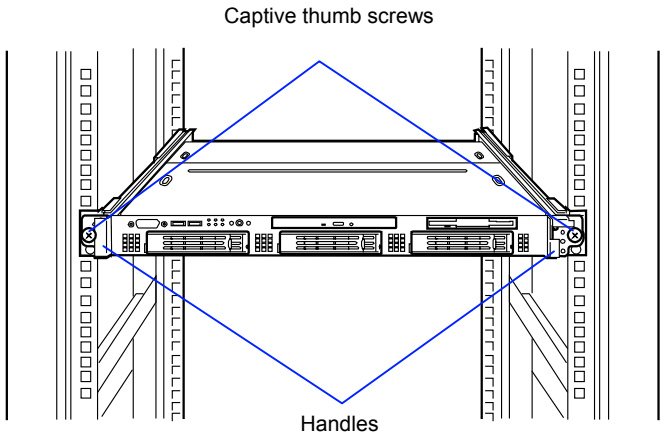
3. <This step is required only when the optional cable arm is mounted.>

Remove the two screws securing the cable arm, and dismount the cable arm from the server.

4. Loosen the two captive thumb screws.

5. Hold the handle and pull out the server from the rack slowly and carefully.

The server clicks to be latched.

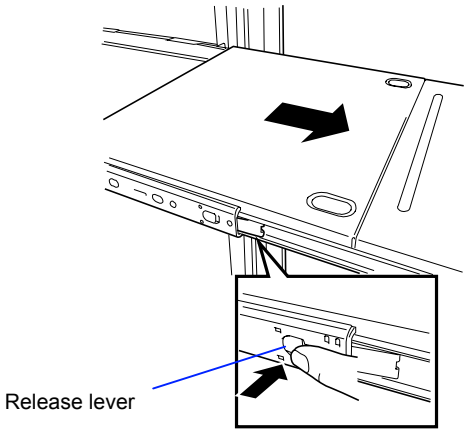


6. Pull out the server from the rack with the right and left release lever pressed to release the latch.

IMPORTANT:

- Pull out the server slowly holding the bottom of the server by at least two persons.
- Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.

To remove some mechanical parts of the rack, see the installation procedure.



CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

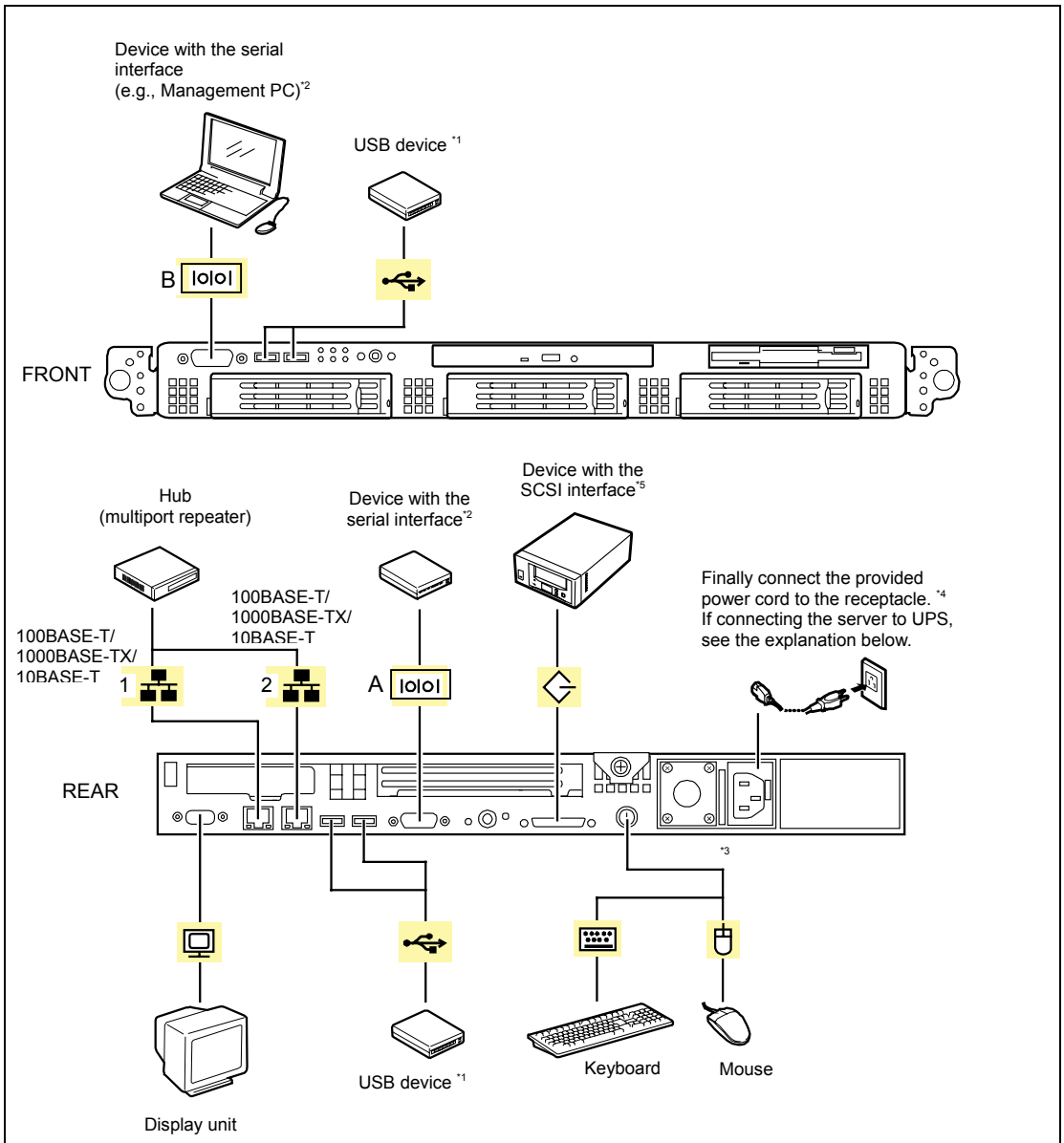
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not connect any interface cable with the power cord of the NEC Express Server plugged to a power source.
- Do not use any unauthorized interface cable.

IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for availability of such a device or cable. Some third-party devices may not be used for the server.
- The total length of a cable (including the connection cable in SCSI device) is limited by the SCSI standard. Ask your sales representative for details.
- A leased line cannot be connected directly to the serial port connectors.
- Secure the power cord(s) and interface cables with a tie wrap.
- Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.



*1 Any USB keyboard and mouse are not supported.
*2 A leased line cannot be connected directly to this connector.
The console of a management PC can be connected to only serial port 2. (BIOS setup required.)
*3 Use the provided branch cable.
*4 Connect the power cord to a circuit breaker of 15 A or less.
*5 SCSI hard disk drive model only. Exclusively used with the onboard SCSI connector.

CONNECTING POWER CORD

Connect the provided power cord to the server.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use the authorized power cord only.

1. Plug the provided power cord into the power receptacle on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.

IMPORTANT:

- Connect the power cord to a circuit breaker of 15A or less.
- Secure the power cord with a tie wrap.

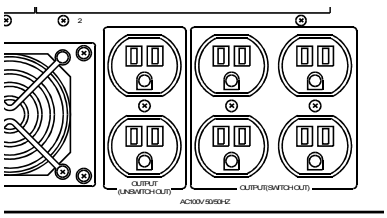
To connect the power cord from the server to an uninterruptive power supply (UPS), use service outlets on the rear of the UPS.

The UPS service outlets are categorized into two groups: SWITCH OUT and UN-SWITCH OUT. (They may be called "OUTPUT1" and "OUTPUT2".)

To control power supply with an application (NEC ESMPRO/UPSController) that controls the UPS, connect the power cord to an SWITCH OUT outlet.

For constant power supply, connect the power cord to a UN-SWITCH OUT outlet. (Connect the modem that is in service for 24 hours to this outlet.)

<Example>



When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC-LINK] - [Power On].

Change a parameter for "AC-LINK" under the Server menu of the BIOS SETUP utility. See Chapter 4 for details.

TURNING ON THE SERVER

Turn on the server and follow the on-screen instructions for setup.

IMPORTANT: Before turning on the server:

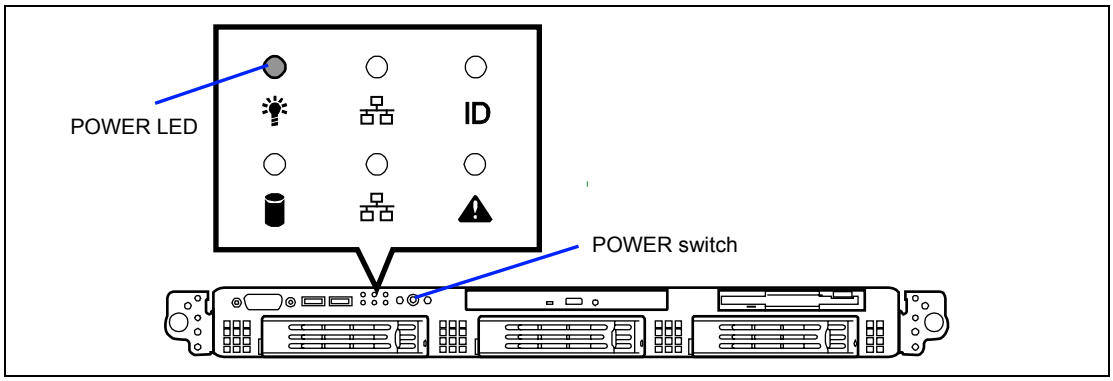
- Some optional boards require setups with the SETUP utility before installation. If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility is enabled to launch. Check on the board specifications to find out whether it requires pre-installation setups before actually installing the board.
- Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.

To use the server with no optional devices installed besides the graphic board, install a desired OS to the server.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.
2. Power on the video display and any other external devices.
3. Make sure that the floppy disk drive contains no floppy disk and the CD-ROM drive contains no bootable CD-ROM.
4. Open the front bezel.
5. Press the POWER switch.

NOTES:

- If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.
- If the remote management card (RMC) is installed in your server, connect the power cord and wait a few seconds before pressing the POWER switch. The POWER switch does not work in a few seconds after connecting the power cord due to RMC firmware start-up.



The POWER LED on the front of the server comes on.

In a few seconds, the NEC logo appears on the screen and the Power On Self-Test (POST) begins.

The POST runs automatically when you power on the server or reset it with a keyboard operation (**Ctrl** + **Alt** + **Delete**). The POST runs diagnostics, initializes the server, sets interrupt vectors, detects installed peripheral devices, and boots the operating system (if installed). See Chapter 2 for detailed description on POST.

If the server halts before completing the POST, the POST emits a beep code indicating a fatal system error requiring immediate attention. (See Chapter 8, "Troubleshooting," for troubleshooting information.)

During memory test, the POST displays the amount of memory it was able to access and test. Depending on the amount of installed memory, it may take several minutes to complete the memory test.

NOTE: The factory-set is defined to hide the POST screen with the NEC logo screen. You can always change the NEC logo screen to the POST screen by pressing **Esc**. To change the start-up screen, use the BIOS setup utility, "SETUP." (See Chapter 4 for details.)

During the POST, you will see the banner message to prompt you to launch the BIOS SETUP utility stored in ROM on system board or on an installed option board.

Start the BIOS SETUP utility appropriate to your system environment to change the BIOS setup. For the BIOS SETUP for the server, see Chapter 4. For the BIOS SETUP for the option board, refer to the manual that comes with the option board.

INSTALLING OPERATING SYSTEM

See Chapter 5 for installing the Microsoft Windows Server 2003 or Microsoft Windows 2000 operating systems.

To install the other operating system listed above, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See the next chapter for detail.

INSTALLING UTILITIES

Install the utilities that come with the server. See Chapter 6 for details.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Chapter 4

Configuring Your Server

Configuration and setup utilities are used to change your system configuration. You can configure your system, as well as option boards you may add to your system, using the BIOS Setup Utility. Several unique system parameters are configured using the BIOS Setup, which is stored in the system FLASH memory.

The Adaptec Configuration Utility detects the SCSI host adapters on the system board. Use this utility if you need to configure the two SCSI controllers in your system, to configure the hard disk drives connected to a SCSI controller as a RAID drive, or to perform a SCSI disk format or verify disk operation on the SCSI disk drives. The Adaptec Configuration Utility is also used to configure any SCSI removable media devices installed in your system.

If your system has been factory configured, the BIOS Setup or Adaptec Configuration Utility do not need to be run unless you want to change the password or security features, add certain types of option boards or devices, or upgrade your system board.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

SYSTEM BIOS (SETUP)

The SETUP utility is used to change system configuration parameters. This utility is pre-installed in the flash memory of the server and ready to run.

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you don't need to use the SETUP utility in most cases. However, you might wish to use the SETUP utility in the cases described below.

IMPORTANT:

- The SETUP utility is intended for system administrator use only.
- The SETUP utility allows you to set a password. The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
- Do not set any password before installing the OS.
- The server contains the latest version of the SETUP utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this manual. If you find anything unclear, see the online help or ask your service representative.
- Use the Exit menu when exiting the SETUP utility. Exiting the utility with the POWER switch or reset operation causes the stored parameters to lose.

Starting SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen.

```
Press <F2> to enter SETUP
```

Press **F2** to start the SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

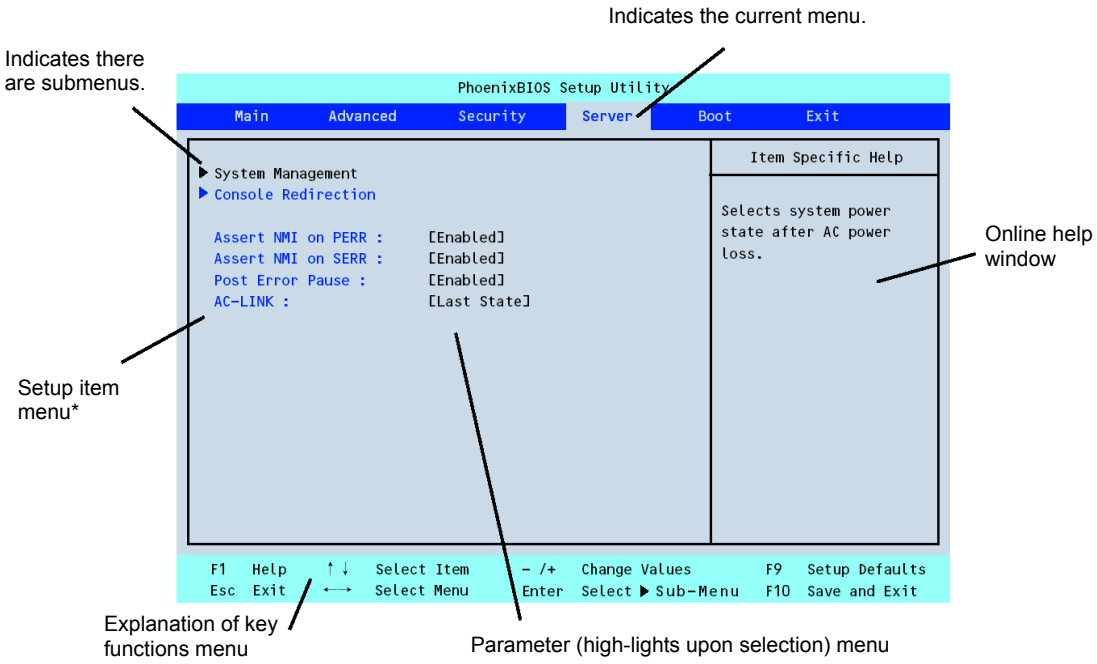
```
Enter password:[                ]
```

Up to three password entries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off the server.

NOTE: The server is provided with two levels of password: Administrator and User. With the Administrator password, you can view and change all system parameters. With the User password, system parameters available for viewing and changing are limited.

Description on On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility. (Key functions are also listed at the bottom of the screen.)


Indicates the current menu.
Indicates there are submenus.
PhoenixBIOS Setup Utility
Main
Advanced
Security
Server
Boot
Exit
System Management
Console Redirection
Assert NMI on PERR : [Enabled]
Assert NMI on SERR : [Enabled]
Post Error Pause : [Enabled]
AC-LINK : [Last State]
Item Specific Help
Selects system power state after AC power loss.
Online help window
Setup item menu*
F1 Help ↑ ↓ Select Item - /+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit
Explanation of key functions menu
Parameter (high-lights upon selection) menu

* The menus displayed in gray indicates the information only or unchangeable secured by BIOS password.

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Exit menu.
– and **+**:	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "➤") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Exit SETUP and return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Save and exit the SETUP utility.

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To set minute functions, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory-set, for each menu.

Main

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Set the system time.	
System Date	MM/DD/YYYY	Set the system date.	
Legacy Floppy A	Disabled 360Kb 5 1/4 1.2MB 5 1/4 720Kb 3 1/2 [1.44/1.25MB 3 1/2] 2.88MB 3 1/2	Set the settings of floppy disk drive A (standard configuration).	
Legacy Floppy B	[Disabled] 360Kb 5 1/4 1.2MB 5 1/4 720Kb 3 1/2 1.44/1.25MB 3 1/2 2.88MB 3 1/2	Set the settings of floppy disk drive B. No second floppy disk drive is included in this system.	
Hard Disk Pre-Delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Allows slower spin-up drives to come ready.	
Primary IDE Master/ Primary IDE Slave Secondary IDE Master Secondary IDE Slave Serial ATA Channel 0 Master Serial ATA Channel 1 Master	Select submenu	Set the information on the device connected to each channel on the submenu. The settings of some items may be changed. However, leave the items as they are at the shipment.	
Processor Settings	Select submenu	Shows the processor settings submenu.	
Language	[English (US)] Italiano Español Français Deutsch	Select which language BIOS displays.	

[ ]: Factory-set

Primary IDE Master/Primary IDE Slave/Secondary IDE Master/Secondary IDE Slave/Serial ATA Channel 0 Master/ Serial ATA Channel 1 Master

Correspondence between the menu items and devices:

- Primary IDE Master: ATA hard disk drive 1 (option)
- Primary IDE Slave: ATA hard disk drive 2 (option)
- Secondary IDE Master: CD-ROM drive (standard)
- Secondary IDE Slave: None
- Serial ATA Channel 0 Master: Serial ATA hard disk drive 1 (option)
- Serial ATA Channel 1 Master: Serial ATA hard disk drive 2 (option)

Option	Parameter	Description	Your Setting
Type	None User [Auto] CD-ROM	Selects the type of device attached to the IDE or serial ATA channel. It is strongly recommended to keep the factory setting [Auto].	
The following options do not appear when *None* or *Auto* are selected for Type.			
Multi-Sector Transfers	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Specifies the number of sectors that are transferred per block during multiple sector transfers.	
LBA Mode Control	Enabled Disabled	Enable/disable LBA instead of cylinder, head, sector, addressing.	
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/DMA1 FPIO 4/DMA2	Select the method for moving data to/from the drive.	
Ultra DMA	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Select the Ultra DMA mode used for moving data to/from the drive.	

[ ]: Factory-set

Processor Settings

Option	Parameter	Description	Your Setting
Processor Retest	[No] Yes	If yes, BIOS will clear historical processor status and retest the processor on the next boot.	
Processor Speed	nnn GHz	Displays clock speed for the processor. (View only)	
Processor 1 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 1 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Processor 2 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 2 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Hyper-Threading Technology	[Enabled] Disabled	Disable or enable the Hyper-Threading Technology.	
Execute Disable Bit	[Disabled] Enabled	Displays the CPU which supports Execute Disable Bit.	

[ ]: Factory-set

Advanced

Option	Parameter	Description	Your Setting
Memory Configuration	–	Displays Memory Configuration submenu.	
PCI Configuration	–	Displays PCI Configuration submenu.	
Peripheral Configuration	–	Displays Peripheral Configuration submenu.	
Advanced Chipset Control	–	Displays Advanced Chipset Control submenu.	
Boot-time Diagnostic Screen	[Enabled] Disabled	When disabled, the BIOS will display the NEC logo during POST. Press **Esc** to switch to the POST execution screen.	
Reset Configuration Data	[No] Yes	Select "Yes" if you want to clear the system configuration data during the next boot. Automatically reset to "No" in the next boot.	
NumLock	[Auto] On Off	Sets power on Numlock state.	
Memory/Processor Error	[Boot] Halt	If "Halt" is selected, the boot is stopped when POST error occurs.	
SATA RAID Enable	[Disabled] Enabled	If enabled, the BIOS uses the hard disk drives connected to the onboard SATA connectors as the RAID drive.	

[ ]: Factory-set

Memory Configuration

Option	Parameter	Description	Your Setting
System Memory	nnn KB	Indicates the total capacity of the basic memory. (View only)	
Extended Memory	nnnnnnn KB	Indicates the total capacity of the extended memory. (View only)	
DIMM Group #1 - #4	Normal Disabled Not installed	Indicates the current memory status. "Normal" indicates the normal status, "Disabled" indicates a memory error, and "Not installed" indicates no DIMM installed (view only). Group #1 indicates DIMMs in DIMM sockets #1 and #2. Group #2 indicates DIMMs in DIMM sockets #3 and #4. Group #3 indicates DIMMs in DIMM sockets #5 and #6. Group #4 indicates DIMMs in DIMM sockets #7 and #8. (Memory is interleaved and two DIMMs are used in pair.)	
Memory Retest	Yes [No]	Causes BIOS to retest all memory on the next boot.	
Extended RAM Step	1MB 1KB Every location [Disabled]	"1MB" indicates that the memory test is done in the unit of 1MB. "1KB" indicates that the memory test is done in the unit of 1KB. "Every location" tests every memory location. "Disabled" indicates that only memory initialization is done.	
Online Spare Memory	[Disabled] Enabled	Disables or enables online spare memory feature. See "DIMM" in Chapter 8 for details.	

[ ]: Factory-set

PCI Configuration

– Embedded SCSI submenu

Option	Parameter	Description	Your Setting
SCSI Controller	[Enabled] Disabled	Enables or disables the onboard SCSI controllers.	
Option ROM Scan	[Enabled] Disabled	If Enabled, initialize device expansion ROM.	

[ ]: Factory-set

– Embedded NIC (Dual Gbit) submenu (SCSI model only)

Option	Parameter	Description	Your Setting
LAN Controller	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset. In this configuration, the controller hardware is completely disabled, and will be invisible to the PnP operating systems.	
Option ROM Scan	[Enabled] Disabled	If Enabled, initialize device expansion ROM.	

[ ]: Factory-set

– Embedded Video Controller submenu

Option	Parameter	Description	Your Setting
Onboard VGA Control	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset. In this configuration, the controller hardware is completely disabled, and will be invisible to the PnP operating systems.	

[ ]: Factory-set

Option	Parameter	Description	Your Setting
PCI Slot 1B Option ROM	Disabled [Enabled]	Used to enable or disable an option ROM on a PCI board connected to the full-height riser card.	
PCI Slot 1C Option ROM	Disabled [Enabled]	Used to enable or disable an option ROM on a PCI board connected to the low-profile riser card.	
Option PCI-X Riser Support	[Disabled] Enabled	Cannot be used in this system. Do not change the factory setting.	
PCIe Option Mode	[Disabled] Enabled	Cannot be used in this system. Do not change the factory setting.	

[ ]: Factory-set

Peripheral Configuration

IMPORTANT: Note that the interrupt and/or base I/O address are not overlapped with others. If the value set for the interrupt or base I/O address is used in another resource, the yellow asterisk (*) appears. Reset any item with the yellow asterisk properly.

Option	Parameter	Description	Your Setting
Serial Port A	Disabled [Enabled] Auto	Selects whether serial port A is enabled or disabled.	
Base I/O address	[3F8] 2F8 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	IRQ 3 [IRQ 4]	Selects the interrupt for a serial port A.	
Serial Port B	Disabled [Enabled] Auto	Selects whether serial port B is enabled or disabled (display only).	
Base I/O address	3F8 [2F8] 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	[IRQ 3] IRQ 4	Selects the interrupt for a serial port A.	
PS/2 Mouse	Disabled [Enabled] Auto Detect	If disabled, PS/2 mouse port will not function.	
USB Host Controller	Disabled [Enabled]	If disabled, the USB ports do not accept the USB device class 3 (HID: Human Interface Device).	
Legacy USB Support	Disabled [Enabled]	Selects whether the USB keyboard is made available in OS which does not support USB formally.	
Parallel ATA	Disabled Channel 0 Channel 1 [Both]	Selects parallel ATA is enabled or disabled.	
Serial ATA	Disabled [Enabled]	Selects whether the serial ATA is enabled or disabled.	

[ ]: Factory-set

Advanced Chipset Control

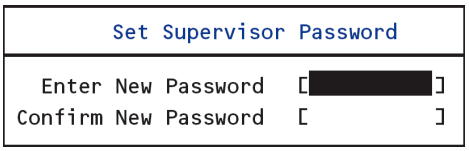
Option	Parameter	Description	Your Setting
Enable Multimedia Timer	[No] Yes	Specify whether the system supports the multimedia timer feature.	
Wake On LAN/PME	Disabled [Enabled]	Specify whether the remote power-on function through embedded NIC, PCI devices in slots 1 to 5 is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specify whether the remote power-on function through a serial port is enabled or disabled.	
Wake On RTC Alarm	[Disabled] Enabled	Specify whether the remote power-on function by using RTC alarm feature is enabled or disabled.	

[ ]: Factory-set

Security

The Security menu appears if you move the cursor to the position of "Security."

Press **Enter** on "Set Supervisor Password" or "Set User Password," to display the following screen.



Enter the passwords on the dialog box. Passwords may have up to eight characters including alphanumerics and symbols.

IMPORTANT:

- User password can be set only when Administrator password is already set.
- Set the passwords only after OS is installed.

See the table below for the items.

Option	Parameter	Description	Your Setting
User Password Is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Supervisor Password Is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Set User Password	Up to eight alphanumerics	Supervisor password controls access to the setup utility. When Enter is pressed, the user is prompted for a password; press **Esc** to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	

Option	Parameter	Description	Your Setting
Set Supervisor Password	Up to eight alphanumerics	When the <**Enter**> key is pressed, the user is prompted for a password; press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	
Password on boot	[Disabled] Enabled	Disables or enables password entry on boot.	
Fixed disk boot sector	[Normal] Write Protect	Will write protect the boot sector of the hard drive to prevent viruses from corrupting the drive under DOS if set to write protect.	
Secure Mode Timer	[Disabled] 1 min 2 min 5 min 10 min 20 min 1 hr. 2 hr.	Set the period from no input from the keyboard or mouse to the point at which the system enters into the secure mode.	
Security Hot Key CTRL-ALT-	[L] Z	Specify the hot key to invoke secure mode features. Pressing the assigned key along with **Ctrl** and **Alt** invoke secure mode. This option is enabled when User Password is set.	
Secure Mode Boot	[Disabled] Enabled	Specify whether the system boots in secure mode. This option is enabled when User Password is set.	
Video Blanking	[Disabled] Enabled	Specify whether to turn off the monitor when secure mode is activated.	
Floppy Write Protect	[Disabled] Enabled	Controls access to the floppy disk drive during the secure mode.	
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

[ ]: Factory-set

Server

Option	Parameter	Description	Your Setting
System Management	–	System Management submenu is displayed.	
Console Redirection	–	Console Redirection submenu is displayed.	
Assert NMI on PERR	Disabled [Enabled]	Specify whether to support PCI PERR or not.	
Assert NMI on SERR	Disabled [Enabled]	Specify whether to support PCI SERR or not.	
FRB-2 Policy	Disable FRB2 Timer [Retry 3 Times]	Set the FRB level 2 timer.	
Boot Monitoring	[Disabled] 5 Minutes 10 Minutes 15 Minutes 20 Minutes 25 Minutes 30 Minutes 35 Minutes 40 Minutes 45 Minutes 50 Minutes 55 Minutes 60 Minutes	Specify whether to enable or disable the boot monitoring function on booting, or select the time limit for timeout. To use this function, install NEC ESMPRO Agent. Set this item to "Disabled" if the system is booted from OS without installation of NEC ESMPRO Agent.	
Boot Monitoring Policy	[Retry 3 Times] Retry Service Boot Always Reset	Specify the processing at the occurrence of timeout during boot monitoring. If [Retry 3 times] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. If [Retry Service Boot] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. Then the boot is tried from the service partition for three times. The failure in the third boot causes the system to stop booting. If [Always Reset] is selected, the system is reset after the occurrence of timeout and OS boot is retried repeatedly. * If no service partition exists in the system, OS boot is retried repeatedly from the system partition.	
Thermal Sensor	Disabled [Enabled]	Specify whether to enable or disable the thermal sensor monitoring function. If a thermal error is detected with this item being set to "Enabled", the system stops at the end of POST.	
Post Error Pause	Disabled [Enabled]	Specify whether to stop the POST once at the end of POST if an error occurs during the POST.	

Option	Parameter	Description	Your Setting
AC-LINK	Stay Off [Last State] Power On	Specify the state of power when the AC power to the server is turn off once and then on.	
Power On Delay Time (Sec)	[0] - 255	Specify the power on delay time within the range between 0 and 255 seconds. The time specified is valid when "Power On" or "Last State" is specified for AC LINK.	
Platform Event Filtering	[Disabled] Enabled	This item becomes meaningless when the notification feature of remote management card (RMC) is enabled.	

[ ]: Factory-set

IMPORTANT: To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC LINK] - [Power On].

The table below shows the operation when the AC power to the server is turn off once and then on again, depending on the setting of "AC LINK."

System status before AC power off	Setting of AC LINK		
	Stay Off	Last State	Power On
Operating	Off	On	On
Aborting (DC power being off also)	Off	Off	On
Forced shutdown	Off	Off	On

* Press the power switch continuously for four seconds or longer. This forcibly turns off the power.

System Management Submenu

Option	Parameter	Description	Your Setting
BIOS Version	–	Displays the current BIOS version. (View only)	
IPMI Specification Version	–	Displays IPMI specification version. (View only)	
BMC Device ID	–	Displays BMC device ID. (View only)	
BMC Device Version	–	Displays BMC device version. (View only)	
BMC Firmware Version	–	Displays BMC firmware version. (View only)	
PIA Version	–	Displays version of the platform information area. (View only)	
SDR Revision	–	Displays revision of the sensor data record.	

[ ]: Factory-set

Console Redirection Submenu

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the address/interrupt of the serial port to which a remote console is connected.	
ACPI Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the serial port to which an ACPI console is connected.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specify the baud rate used for the interface with successive remote consoles.	
Flow Control	None Xon/Xoff [CTS/RTS] CTS/RTS+CD	Specify the flow control method.	
Console Type	[PC ANSI] VT100+ VT-UTF8	Specify the type of remote console.	

[ ]: Factory-set

Event Log Configuration Submenu

Option	Parameter	Description	Your Setting
Clear all Event Logs	–	Press **Enter** and select "Yes" to clear the system event log.	

[ ]: Factory-set

Boot

If you move the cursor to the position of "Boot," the Boot menu appears, which is used to set the boot priority.

The factory-default boot order is listed below.

1. CD-ROM drive
2. Removable Devices
3. Hard Drive
4. IBA GE Slot 0200 v1216
5. IBA GE Slot 0219 v1216

The server searches for devices in the order set in this menu on booting. Finding the boot software, the server starts the software.

The priority of the boot devices can be changed by using the ↑, ↓, **+**, and **-** keys. Move the cursor to the desired device with the ↑ or ↓ key and change the priority with the **+** or **-** key.

> **IMPORTANT:** To boot NEC EXPRESSBUILDER, set the priority of the devices as shown in the figure above.

Exit

The options on the menu are described below.

Exit Saving Changes

Exit after writing all modified BIOS Setup item values to CMOS.

Exit Discarding Changes

Exit leaving CMOS unmodified. User is prompted if any of the setup fields ware modified.

Load Setup Defaults

Load default values for all BIOS Setup items.

> **IMPORTANT:** This option sets [SATA RAID Enabled] in the [Advanced] menu to [Disable]. If the SATA hard disk drives are installed in your server and the onboard SATA RAID feature is used, change the parameter of the [SATA RAID Enabled] from [Disable] to [Enable] before exiting BIOS Setup.

Discard Changes

Read the previous values of the all BIOS Setup items from CMOS.

Save Changes

Write all BIOS Setup item values to CMOS.

CONFIGURING MOTHER BOARD JUMPERS

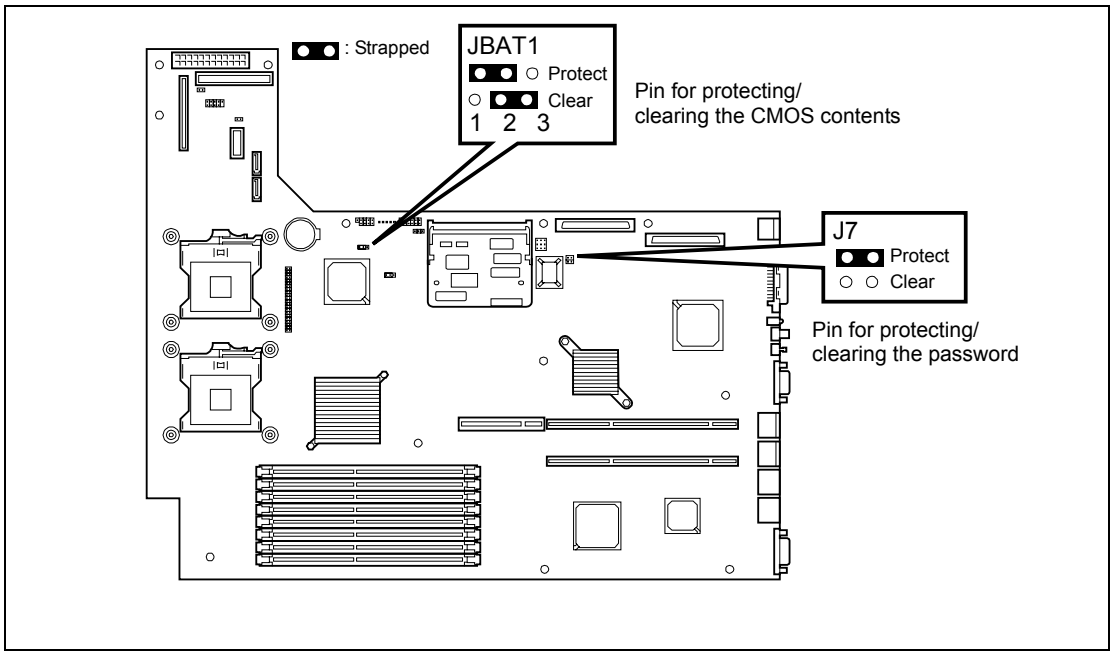
With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users. When you forget the passwords, however, you may want clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.

IMPORTANT:

- Clearing the CMOS data resumes the factory-set configuration data.
- After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your mother board.
  – Load Setup Defaults in the Exit menu
  – Memory Retest of Memory Configuration in the Advanced menu
  – Processor Retest of Processor Settings in the Main menu
  – SATA RAID Enable in the Advanced menu (if your internal SATA hard disk drives are configured with the SATA HostRAID feature)

To clear passwords or the CMOS data, use the jumper switch on the mother board of the server. The following figure illustrates the jumper switch location.

IMPORTANT: Do not change any other switch settings. Any change may cause the server to fail or malfunction.



The following describe the clearing procedure.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Make sure to complete board installation.
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" as described in Chapter 9 of this guide to prepare.
2. Remove the logic cover.
3. Locate the position of the jumpers on the mother board you are changing.
4. For clearing the BIOS password, remove the jumper strap on the BIOS password clear jumper. For Clearing the CMOS, move the jumper strap to the CMOS clear position.

   Refer to the previous illustration to find the location of the jumper.
5. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.
6. Reinstall the server removed in Step 2.
7. Plug the power cord to your server and turn on the server.
8. Press **F2** at the prompt to run the BIOS SETUP utility, and select "Load Setup Defaults" at the Exit menu.

IMPORTANT: If the onboard SATA RAID feature is used in the SATA hard disk drive model, change the parameter of the "SATA RAID Enable" in the Advanced menu from [Disable] to [Enable].

SCSI BIOS (SCSI*Select*)

The SCSI*Select* utility is provided to configure the SCSI controller on the mother board (or the SCSI controller on an optional board). This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.

Using SCSI*Select* Utility

Use the SCSI*Select* utility mainly to set the transfer speed of connected SCSI devices or to configure the internal hard disk drives connected to the onboard SCSI controller as a RAID drive (HostRAID). The SCSI devices include those installed in the backup file bay, such as an external DAT and MO, but not hard disk drives.

> **IMPORTANT:** SCSI configuration must be made on a per-SCSI controller basis with a utility. The server contains one SCSI controller. When you added optional SCSI controllers, you need to make configuration for each SCSI controller in addition to the standard internal SCSI controller. Some additional SCSI controllers may require a different utility to make changes to the configuration.

Configuring SCSI Controller on Mother Board

The following describes configuration for the SCSI controller on the mother board of the server.

Running the Utility

To run the utility, perform the following procedures:

1. Power on the server.

   The following message appears while POST is in progress.

   IMPORTANT: The message appears for each additional SCSI controller.

   ```
   Adaptec SCSI BIOS Vxxx xxxxx
   (c) 2000 Adaptec, Inc. All Rights Reserved

   ◀ ◀ ◀ Press <Ctrl> <A> for SCSISelect(TM) Utility! ▶ ▶ ▶
   ```

2. Press and hold **Ctrl** and **A**.

   The SCSI*Select* utility starts and its Main menu appears.

3. Select the channel and press **Enter**.

   NOTE: "AIC-7902A" is for backup file devices. "AIC-7902B" is for internal SCSI hard disk drives.

   The Options menu appears.

4. Select option in the Options menu and press **Enter**.

   If you wish to configure the adapter or a device, select "Configure/View SCSI Controller Settings".

   If you wish to format a disk, verify disk media, or display a list of devices and their SCSI IDs, select "SCSI Disk Utilities".

Exiting the Utility

To exit the utility, press **Esc** until a message prompts you to exit (if you changed any setting, you are prompted to save the changes before you exit).

Configure/View SCSI Controller Settings

The Configure/View Host Adapter Settings has the following menu items and parameters. Read descriptions to select a correct parameter for each menu item.

SCSI Bus Interface Definitions

To set three menu items under "SCSI Bus Interface Definitions", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection. The following table lists menu items, available parameters, and descriptions.

Menu item	Parameter	Description
SCSI Controller ID	0 - [7] - 15	Select "7".
SCSI Controller Parity	[Enabled] Disabled	Select "Enabled".
SCSI Controller Termination	[Enabled] Disabled	Enable or disable the SCSI termination. Select "Enabled".

[ ]: Factory-set

Additional Options

To set three menu items under "Additional Options", select a menu item with the cursor keys (↓ or ↑) and press **Enter** to display its submenu. Then, select a submenu item with the cursor keys (↓ or ↑) and press **Enter** to fix the item. Use the cursor keys (↓ or ↑) for parameter selection.

- **Boot Device Configuration**

  Move the cursor onto "Boot Device Configuration" and press **Enter** to display the submenu. The Boot Device Configuration submenu allows you to select the device connected to the channel A or B as a boot device. Always select "AIC-7902 A".

■ SCSI Device Configuration

Move the cursor onto "SCSI Device Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameters, and descriptions.

IMPORTANT: Select a parameter for each submenu item on a per-SCSI ID basis. Verify the SCSI ID of a desired device before configuration.

NOTE: To find out the SCSI ID for the optional device connected, select "SCSI Disk Utilities" on the Options menu and press **Enter**. See "SCSI Disk Utilities" for detail.

Submenu item	Parameter	Description
Sync Transfer Rate (MB/Sec)	[320] 33.3 160 20.0 80.0 10.4 66.6 ASYN 40.0	Select "320". You may need to change the value depending on your optional device. Refer to the manual that comes with your optional device for details.
Packetized	[Yes] No	Optimizes bus utilization and minimizes command overhead to bolster performance by transferring commands, data, and status using Deal Transition (DT) data phases.
QAS	[Yes] No	Quick Arbitration and Selection (QAS) reduces the overhead of control release on the SCSI bus from one device to another to help decrease command overhead and increase bus utilization.
Initiate Wide Negotiation	[Yes] No	Select "Yes" if your SCSI device supports the Wide SCSI interface. Select "No" if not.
Enable Disconnection	[Yes] No	Select "Yes".
Send Start Unit Command	[Yes] No	Select "Yes" to send the command to the hard disk drive. Otherwise select "No".
BIOS Multiple LUN Support	Yes [No]	Select "No".
Include in BIOS Scan	[Yes] No	Select "Yes".

[ ]: Factory-set

■ Advanced Configuration

Move the cursor onto "Advanced Configuration" and press **Enter** to display the submenu.

The following table lists submenu items, available parameter, and descriptions.

Submenu item	Parameter	Description
Reset SCSI Bus at IC Initialization	[Enabled] Disabled	Select "Enabled".
Display <Ctrl><A> Message During BIOS Initialization	[Enabled] Disabled	Select "Enabled".
Extended Int 13 Translation for DOS Drives > 1 GByte	[Enabled] Disabled	Select "Enabled".
POST Display Mode	[Verbose] Silent Diagnostic	Select "Verbose".
SCSI Controller Int 13 Support	[Enabled] Disabled: NOT Scan Disabled: scan bus	Enable or disable SCSI BIOS. Select "Enabled" for most cases other than the following: • To boot the OS from a hard disk drive connected to any other controller than SCSI controller. (If the controller has no hard disk drives connected, there is no problem.) • BIOS of the SCSI controller may be disabled to reserve an area in the expansion ROM space if the controller has no hard disk drives connected.
Domain Validation	[Enabled] Disabled	Select "Enabled".
Support Removable Disks Under Int 13 as Fixed Disks	Boot Only All Disks [Disabled]	AIC-79xx BIOS automatically controls the removable disks.
BIOS Support for Bootable CD-ROM	[Enabled] Disabled	Select "Enabled".

[ ]: Factory-set

■ HostRAID

Move the cursor onto "HostRAID" and press **Enter** to choose the HostRAID option.

Submenu item	Parameter	Description
HostRAID	Enabled [Disabled]	Select "Disabled" if the onboard HostRAID controller is not used.

[ ]: Factory-set

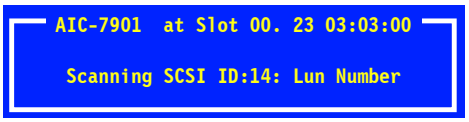
NOTE: For detail explanation on the HostRAID feature, see SCSI*Select* Utility User's Manual and Adaptec Storage Manager™ - Browser Edition User's Guide or Adaptec Storage Manager™ User's Guide. You may view or print these documents from the NEC EXPRESSBUILDER CD-ROM.

SCSI Disk Utilities

This utility scans the SCSI bus for SCSI devices, reports a description of each device. Run these utilities before configuring SCSI devices.

To enter the utility, select "SCSI Disk Utilities" on the Options menu.

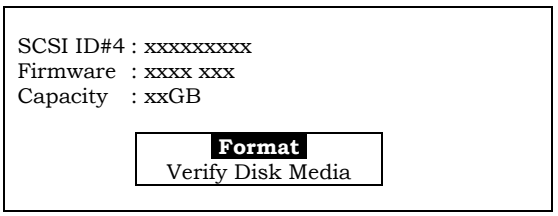
The SCSI ID scan begins displaying the message as shown below.



When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.

Find out the SCSI ID for the installed optional on this screen. You can also view the device information by selecting a device and pressing **Enter**.

The following sub menu appears.



The following table lists submenu items and descriptions.

Submenu item	Description
Format	Formats the selected device in the raw level.
Verify Disk Media	Verifies all the sectors in the selected device. If one or more bad sectors are found, reassigns the sectors.

Configuring SCSI Controller on Optional Board

To configure SCSI devices connected to an optional SCSI controller board, use the SCSI BIOS utility provided with the optional SCSI controller board.

Refer to the manual that comes with the optional SCSI controller board for details.

When the server has multiple SCSI controller boards installed, the server first displays the start-up message of the SCSI*Select* utility for the SCSI controller on the mother board. It then displays the utility start-up message for additional SCSI controllers one by one. The start-up message appears for the SCSI controller board in the PCI #6 slot first, the PCI #5, #4, #3, onboard SCSI, #2, and finally #1. The message displayed may vary depending on the optional SCSI controller board. Refer to the manual that comes with the optional SCSI controller board for details.

RAID BIOS

The RAID (Redundant Array of Inexpensive Devices) option available for your system is N8103-80F/81F/86F RAID controller boards which give your system the added security of fault tolerance.

If you want to change the RAID level or add additional hard disk drives to the array, use the RAID configuration utility. The RAID configuration utility is included with a RAID controller.

If you are adding the RAID controller to an existing system, the RAID configuration utility allows you to configure your disk array before reinstalling your network operating system. The RAID controllers support various versions of RAID technology (referred to as RAID levels). To use any RAID level, you must configure the RAID controller using the RAID configuration utility prior to installing your Network Operating System. For an explanation of this utility, refer to the documentation that comes with the RAID controller. It describes RAID technology and provides tips on making your array perform well in your specific application. It also covers array hardware preparation, configuration, and initialization. After completing the steps in the manual, you can install your Network Operating System.

If you want to remotely configure the array (from a PC client); increase array capacity online; or monitor statistics on disk and controller activity, you must install the array manager provided with your RAID subsystem. Increasing array capacity is covered in the documentation shipped with the option.

RAID CONFIGURATION

This section describes how to use the internal hard disk drives in the disk array RAID configuration. To use an external hard disk drive in a disk array, the optional disk array controller and the additional disk drive are necessary. Refer to the manual of the optional disk array controller or additional external disk drive for details.

To configure the internal hard disk drives as the disk array drive:

- For SCSI model, configure the three SCSI hard disk drives by using the onboard RAID controller.
- For SATA model, configure the two SATA hard disk drives by using the onboard RAID controller.
- Configure the hard disk drives by using the optional disk array controller.

RAID Configuration of SCSI Hard Disk Drive

You can configure a disk array (RAID0 or RAID1) by using the onboard RAID controller of the server.

You need up to three SCSI hard disk drives for configuration.

- RAID0 (striping)

  Stores data on two hard disk drives by dividing it (striping). Both hard disk drives can be accessed at the same time. This improves disk access performance compared with using a single hard disk drive.

  IMPORTANT:
  - RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
  - Logical capacity of the array becomes a multiple of the connected hard disk drive.

- RAID1 (mirroring)

  Stores the data being saved to one hard disk dive to another hard disk drive. This method is called "mirroring." When storing data onto one hard disk drive, the same data is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This provides operation without the system going down.

  IMPORTANT:
  - RAID1 reads or writes data to/from the two hard disk drives at the same time. The disk access performance is lower than the single disk.
  - Logical capacity of the array is equal to one hard disk drive connected.

Installing the Hard Disk Drives

Install the two or more SCSI hard disk drives to your server. Refer to Chapter 9 for detail.

> **IMPORTANT:** Use two hard disk drives of the same revolution. In addition, use two hard disk drives of the same capacity if you are going to configure RAID1.

Enabling RAID Feature by SCSISelect Utility

The two or more hard disk drives installed can be used either as a single disk or a RAID drive.

To configure a disk drives as RAID drive, you must specify the hard disk drive being connected to the onboard SCSI connector as a RAID drive by using the SCSISelect Utility.

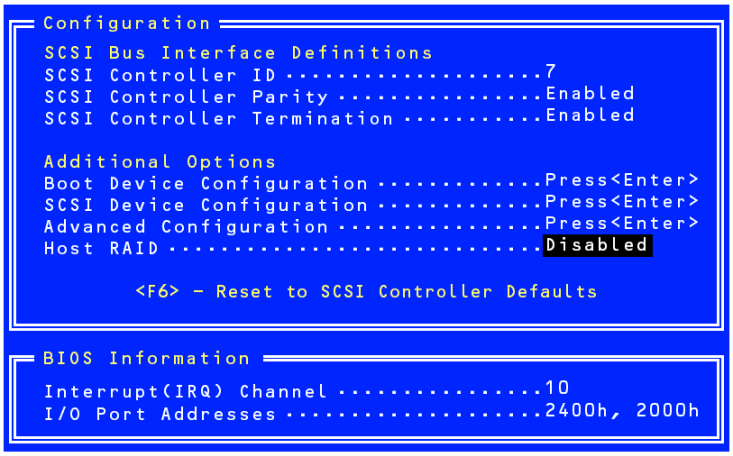
> **NOTE:** The factory-set value is to use the hard disk drive as a single disk drive.

To change settings by SCSISelect Utility:

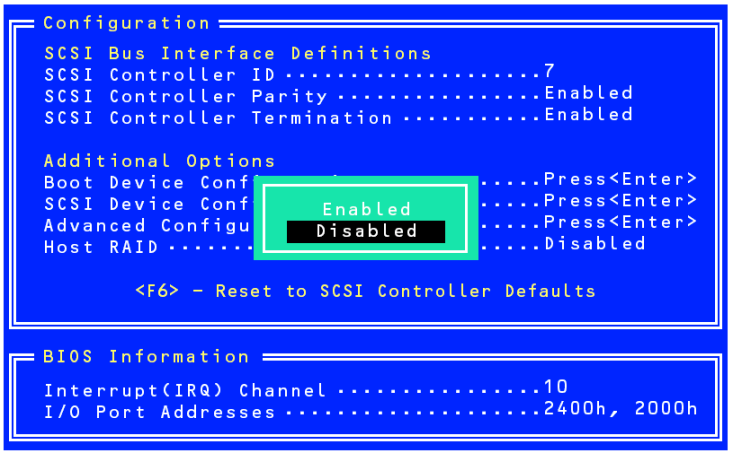
1. Start the SCSISelect Utility.

2. Select the channel to set HostRAID to open the Options window.
3. Select [Configure/View SCSI Controller Settings] and press **Enter.**

4. Select [Disabled] of Host RAID on Configuration menu and press **Enter.**



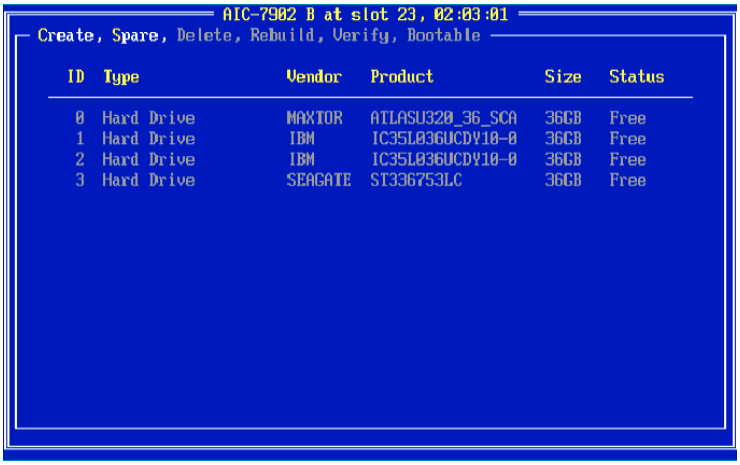
5. Change it to [Enabled].



6. Press **Esc**. The confirmation message [Save Changes Mode?] appears. Select [Yes].
7. Press **Esc** to return to the Options menu.
8. Select [Configure/View HostRAID] and press **Enter**.

Main Menu

When you select [Configure/View HostRAID Settings], the Main Menu as shown below appears upon completion of device scan.


AIC-7902 B at slot 23, 02:03:01
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Hard Drive MAXTOR ATLASU320_36_SCA 36GB Free
1 Hard Drive IBM IC35L036UCDY10-0 36GB Free
2 Hard Drive IBM IC35L036UCDY10-0 36GB Free
3 Hard Drive SEAGATE ST336753LC 36GB Free

Main Menu Display

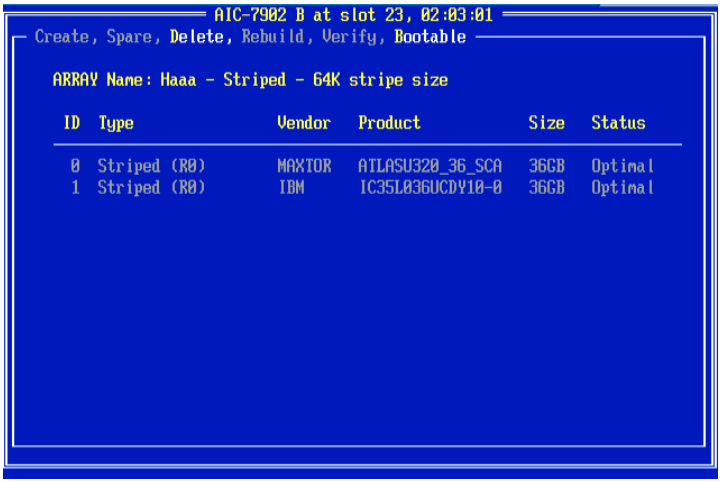
- ID - Indicates SCSI ID of hard disk drive or ID of array.
- Type - Indicates RAID level for the array, and available disk drive that is not in the array.

  - Hard Drive - Available hard disk drive that is not in the array.
  - Striped(R0) - Array configured in RAID0
  - Mirrored(R1) - Array configured in RAID1
  - Stripe/Mirror(R10) - Array configured in RAID10 (spanning of RAID1)
  - Spare - Hard disk drive assigned as a spare disk

- Vendor - Indicates the manufacturer of hard disk drive or HostRAID (Adaptec).
- Product - Indicates the model name of hard disk drive or array name.
- Size - Indicates the capacity of hard disk drive or that of array.
- Status - Indicates the status of hard disk drive or array.

  - Free - Available hard disk drive that is not in the array.
  - Optimal - Array is in normal state.
  - Degraded - One of the RAID1 or RAID10 hard disk drives is failed.
  - Dead - One or more RAID0 hard disk drives is failed.
    Two or more RAID1 or RAID10 hard disk drives are failed.
  - Building - The array is in build process.
  - Verify - The array is in verify process.
  - Rebuild - The array is in rebuild process.

When you select the array on Main Menu, the detailed information of the hard disk drives in array is displayed.


AIC-7902 B at slot 23, 02:03:01
Create, Spare, Delete, Rebuild, Verify, Bootable
ARRAY Name: Haaa - Striped - 64K stripe size
ID Type Vendor Product Size Status
0 Striped (R0) MAXTOR ATLASU320_36_SCA 36GB Optimal
1 Striped (R0) IBM IC35L036UCDY10-0 36GB Optimal

Detailed indications

- ID - Indicates SCSI ID of hard disk drive that configures the array
- Type - Indicates RAID level for the array.

  - ☐ Striped (R0) - Array configured in RAID0
  - ☐ Mirrored (R1) - Array configured in RAID1
  - ☐ Stripe/Mirror (R10) - Array configured in RAID10 (spanning of RAID1)

- Vendor - Indicates the manufacturer of hard disk drive.
- Product - Indicates the model name of hard disk drive.
- Size - Indicates the capacity of hard disk drive.
- Status - Indicates the status of hard disk drive.

  - ☐ Optimal - Hard disk drive is normally operating.
  - ☐ Degraded - Hard disk drive is being degraded.
  - ☐ Failed - Hard disk drive is being failed.
  - ☐ Building - Hard disk drive is being built.
  - ☐ Verify - Hard disk drive is being verified.
  - ☐ Replaced - Hard disk drive is being rebuilt.
  - ☐ Missing - Hard disk drive is being hidden from controller.

Exiting the Utility

To exit the utility, press **Esc** until the following message prompts you to exit. Select [Yes] to exit and press any key to restart the computer. The change you have made becomes valid after the system restarts.

RAID Configuration by SCSISelect Utility

Creating Arrays

Take the following procedures to create an array.

Requirements

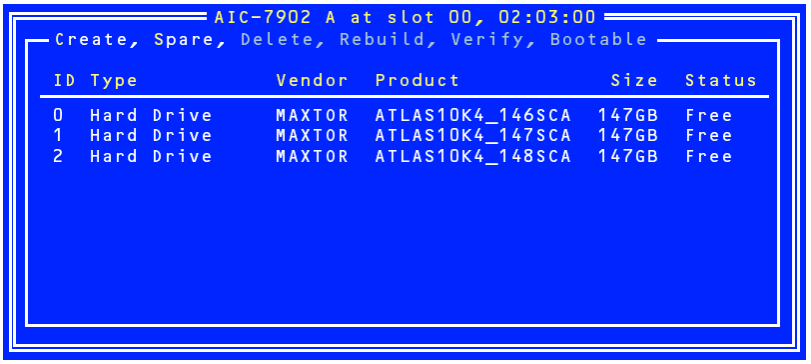
Before creating arrays, make sure the disks for the array are connected and installed in your system.

1. Start the SCSISelect Utility.

   Select [Configure/View HostRAID Settings] from Options menu of the channel to create an array.

2. Press **C** on the main menu to create an array.

   Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **C**.


AIC-7902 A at slot 00, 02:03:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Hard Drive MAXTOR ATLAS10K4_146SCA 147GB Free
1 Hard Drive MAXTOR ATLAS10K4_147SCA 147GB Free
2 Hard Drive MAXTOR ATLAS10K4_148SCA 147GB Free

IMPORTANT:

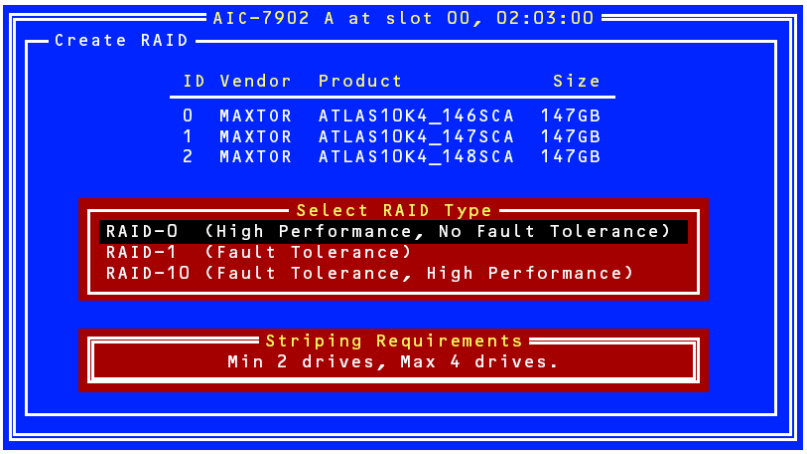
- At least two hard disk drives are required to create an array.
- If the hard disk drives of different capacities are used, the array capacity is determined according to the smaller one.
- Use only the hard disk drives supported by the server.
- The hard disk drive which has been configured as an array disk drive cannot be selected.

3. Select an RAID type in [Select RAID Type] window and press **Enter.**

Put a cursor to the selected item, another window opens indicating the minimum and maximum number of disks to create an array and a message for assigning a spare disk.

NOTE: For setting of RAID, see "Creating RAID0 Array" or "Creating RAID1 Array" described later.

IMPORTANT: After creating an array, set the boot priority for the created array according to "Boot Priority".


AIC-7902 A at slot 00, 02:03:00
Create RAID
ID Vendor Product Size
0 MAXTOR ATLAS10K4_146SCA 147GB
1 MAXTOR ATLAS10K4_147SCA 147GB
2 MAXTOR ATLAS10K4_148SCA 147GB
Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)
Striping Requirements
Min 2 drives, Max 4 drives.

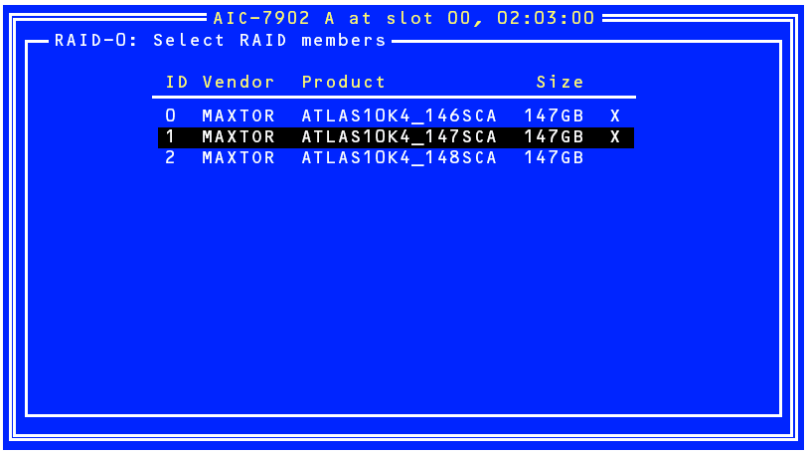
Creating RAID0 Array

To create a RAID0 array:

1. Select [RAID-0] on [Select RAID Type] window.

Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)

2. Use the cursor key to move the focus to the desired hard disk drive and determine it by **Space**, and then press **Enter.**


AIC-7902 A at slot 00, 02:03:00
RAID-0: Select RAID members
ID Vendor Product Size
0 MAXTOR ATLAS10K4_146SCA 147GB X
1 MAXTOR ATLAS10K4_147SCA 147GB X
2 MAXTOR ATLAS10K4_148SCA 147GB

An [X] mark is placed next to the selected hard disk drive.

3. Select the desired stripe size and press **Enter**. Available stripe sizes are 16, 32, and 64 KB.

4. Enter the desired RAID Name in [Assign RAID Name] window.

IMPORTANT:

- RAID Name must be unique and up to 15 characters are acceptable.
- If a valid partition information or a boot block is detected in the selected hard disk drive, a warning message will be displayed. Select [Yes] to continue creating an array, [No] to terminate.
- Take sufficient care not to select the proper hard disk drive. If not, the data will not be restored.

5. The message "Do you want to make this array as bootable?" to prompt you to specify the boot priority of the new array appears. Select [YES] to specify, or [NO] to ignore, and then press **Enter**.

NOTE: The boot priority can be changed after the arrays have been created. To change priority, see "Boot Priority" described earlier.

6. Select [Yes] for the message [Create Array?] and press **Enter.**

   Selecting [No] terminates creating an array and returns to the main menu.

7. Select [Yes] for the message [Are you sure?] and press **Enter.**

   Selecting [No] terminates creating an array and returns to the main menu.

8. Press **Esc** when the message [Build Completed] is displayed to return to the main menu.

NOTE: On the main menu, make sure that "Optimal" is indicated for the status of the created array.

IMPORTANT: After creating an array, set the boot priority for the created array according to "Boot Priority".

Creating RAID1 Array

To create a RAID1 array, perform either of the followings:

- Create a new RAID1 array.
- Migrate to RAID1 array using the data stored in an existing single disk. (Migration)

Creating RAID1 array using the existing single hard disk drive is called "migration". In migration, the source hard disk drive must have been used as the boot disk in the standard SCSI connection.

Refer to "HostRAID Setup Card" for details of migration.

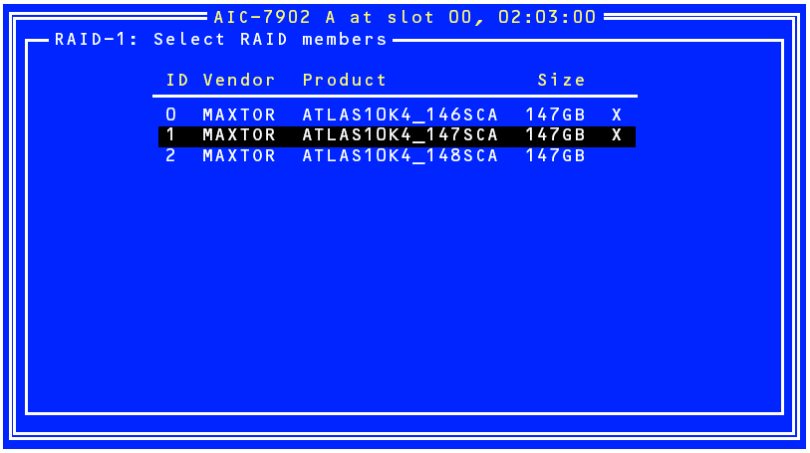
To create a RAID1 array:

1. Select [RAID-1] on the [Select RAID Type] window.

Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)

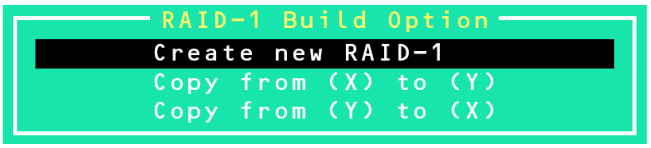
2. Use the cursor key to move the focus to the desired hard disk drive and determine it by **Space**, and then press **Enter.**

   A [X] mark is placed next to the selected hard disk drive.


AIC-7902 A at slot 00, 02:03:00
RAID-1: Select RAID members
ID Vendor Product Size
0 MAXTOR ATLAS10K4_146SCA 147GB X
1 MAXTOR ATLAS10K4_147SCA 147GB X
2 MAXTOR ATLAS10K4_148SCA 147GB

   Select one of the options in [RAID-1 Build Option] window and press **Enter**.

   Available options are as follows:



   – Create new RAID-1: Default
   – Copy from (X) to (Y): Copy data from the disk of ID X to that of ID Y.
   – Copy from (Y) to (X): Copy data from the disk of ID Y to that of ID X.

IMPORTANT:

- To migrate the boot disk that contains an OS, refer to the "Migration in NEC Express5800 Windows".
- Make sure the copy source and copy destination. If they are incorrect, the data will no longer be restored.

3. Enter the desired RAID Name in [Assign RAID Name] window.

IMPORTANT:

- RAID Name must be unique and up to 15 characters are acceptable.
- If a valid partition information or a boot block is detected in the selected hard disk drive or copy target disk drive, a warning message will be displayed. Select [Yes] to continue creating an array, [No] to terminate.
- Take sufficient care not to select the proper hard disk drive or copy destination drive. If not, the data will not be restored.

4. The message "Do you want to make this array as bootable?" to prompt you to specify the boot priority of the new array appears. Select [YES] to specify, or [NO] to ignore, and then press **Enter**.

NOTE: The boot priority can be changed after the arrays have been created. To change priority, see "Boot Priority" described earlier.

5. Select [Yes] for the message [Create Array?] and press **Enter.**

Selecting [No] terminates creating an array and returns to the main menu.

6. Select [Yes] for the message [Are you sure?] and press **Enter.**

Selecting [No] terminates creating an array and returns to the main menu.

When an array has been created, build operation starts.

IMPORTANT: Be sure to complete the Build process. Do not stop the process by pressing **Esc**. OS detects only an array of which build process has been completed and its status is "Optimal". In addition, no OS can be installed in that array.

7. Press **Esc** when the message [Build Completed] is displayed to return to the main menu.

NOTE: On the main menu, make sure that "Optimal" is indicated for the status of the created array.

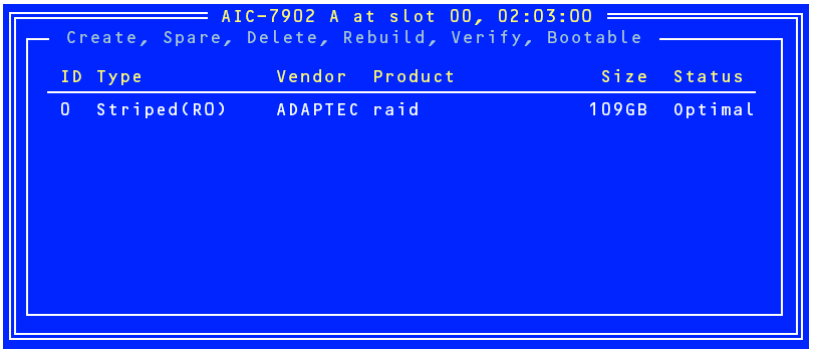
IMPORTANT: After creating an array, set the boot priority for the created array according to "Boot Priority".

Deleting Arrays

To delete an array:

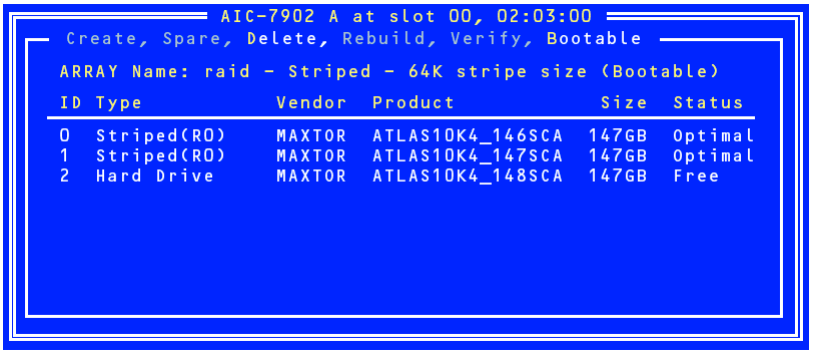
> **IMPORTANT:** Back up the data in the hard disk drive of an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.

1. On the main menu, move cursor to select the array you wish to delete and press **Enter.**


AIC-7902 A at slot 00, 02:03:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Striped(RO) ADAPTEC raid 109GB Optimal

2. Press **D** on the screen shown below.

   Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **D**.


AIC-7902 A at slot 00, 02:03:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ARRAY Name: raid - Striped - 64K stripe size (Bootable)
ID Type Vendor Product Size Status
0 Striped(RO) MAXTOR ATLAS10K4_146SCA 147GB Optimal
1 Striped(RO) MAXTOR ATLAS10K4_147SCA 147GB Optimal
2 Hard Drive MAXTOR ATLAS10K4_148SCA 147GB Free

3. Select [Yes] for the message [Delete Array?] and press **Enter.**

   Selecting [No] returns to the main menu without deleting any array.

4. <RAID0>

[Deleting information] window appears. Select the hard disk drive you wish to delete its partition or boot block, or select [None], then press **Enter**.

<Example>

Drive ID 0: Data in drive 0 is entirely erased. Data in drive 1 is reserved.

Drive ID 1: Data in drive 1 is entirely erased. Data in drive 0 is reserved.

Drive ID 0 & 1: All the data in both drives is erased.

None: Array is deleted, but the data is reserved in both drives.

<Other than RAID0>

The [Deleting information] window is not displayed, proceed to the next step.

IMPORTANT: The partition or boot block of the hard disk drive selected [Deleting information] is deleted.

5. Select [Yes] for the message [Are you sure?] and press **Enter.**

Selecting [No] returns to the main menu without deleting any array.

Creating Spare Disk

One spare disk can be assigned for one channel.

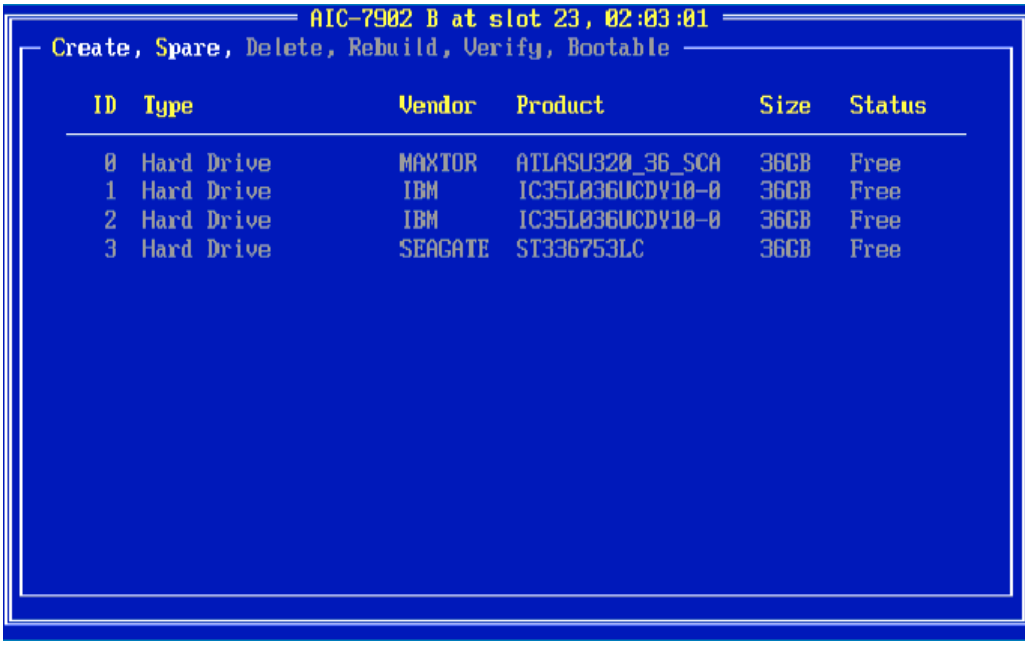
Spare disk is available for RAID1 only.

> **NOTE:** Spare disk must have larger capacity than the hard disk drives configuring the array.
> If the hard disk drives in the array have 73GB or larger and the spare disk is 36GB, a 36-GB disk cannot be used as a spare disk.

To assign a spare disk:

1. Press **S** on Main Menu.

   Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **S**.

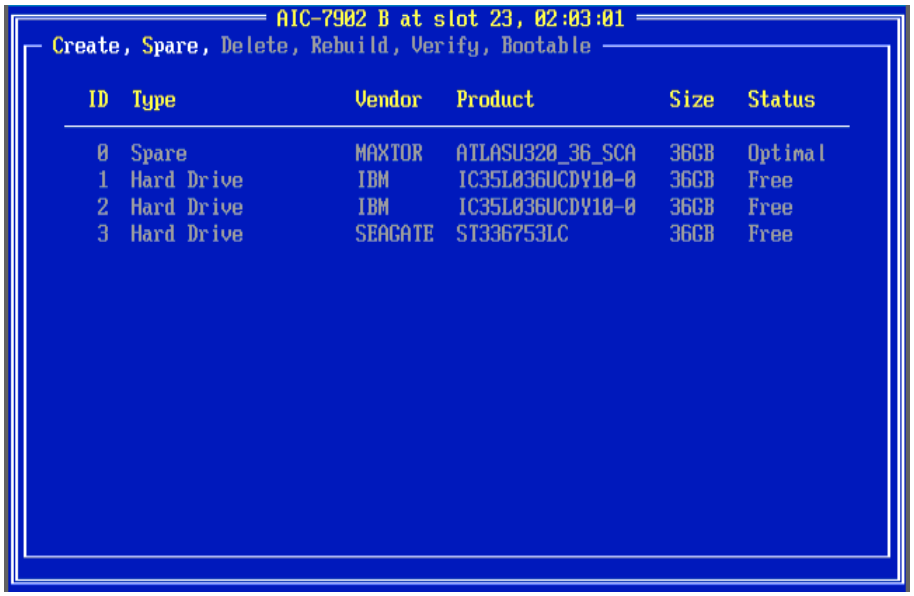

AIC-7902 B at slot 23, 02:03:01
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Hard Drive MAXTOR ATLASU320_36_SCA 36GB Free
1 Hard Drive IBM IC35L036UCDY10-0 36GB Free
2 Hard Drive IBM IC35L036UCDY10-0 36GB Free
3 Hard Drive SEAGATE ST336753LC 36GB Free

2. Select [Add Spare] on the Option window as shown below.

3. Select a hard disk drive for spare disk from the list of available disks, and press **Enter**.
4. Select [Yes] for the message [Are you sure?] and press **Enter.**

   Selecting [No] returns to the main menu without assigning any spare disk.

5. On the main menu, make sure that the type of selected hard disk drive is changed to "Spare", and its status "Optimal".


AIC-7902 B at slot 23, 02:03:01
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Spare MAXTOR ATLASU320_36_SCA 36GB Optimal
1 Hard Drive IBM IC35L036UCDY10-0 36GB Free
2 Hard Drive IBM IC35L036UCDY10-0 36GB Free
3 Hard Drive SEAGATE ST336753LC 36GB Free

To unassign a spare disk, take the same steps from 1 to 4 except for selecting "Delete Spare" instead of "Add Spare".

Boot Priority

To specify boot priority to an array:

1. Select an array you wish to set the boot priority from the main menu and press **Enter.**
2. Press **B** on the window showing the details of array.

   Some characters may not be displayed correctly when console redirection is used. It is no problem on operation. Ignore it and press **B**.

RAID Configuration of Serial ATA Hard Disk Drive

Your server includes the serial ATA RAID controller by supporting the RAID levels 0 and 1.

You need two SATA (serial ATA) hard disk drives for configuration.

- RAID0 (striping)

  Stores data on two hard disk drives by dividing it (striping). Both hard disk drives can be accessed at the same time. This improves disk access performance compared with using a single hard disk drive.

  IMPORTANT:

  - RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
  - Logical capacity of the array becomes a multiple of the connected hard disk drive.

- RAID1 (mirroring)

  Stores the data being saved to one hard disk dive to another hard disk drive. This method is called "mirroring." When storing data onto one hard disk drive, the same data is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This provides operation without the system going down.

  IMPORTANT:

  - RAID1 reads or writes data to/from the two hard disk drives at the same time. The disk access performance is lower than the single disk.
  - Logical capacity of the array is equal to one hard disk drive connected.

Installing the Hard Disk Drives

Install the two serial ATA hard disk drives to your server. Refer to Chapter 9 for detail.

IMPORTANT: Use two hard disk drives of the same revolution. In addition, use two hard disk drives of the same capacity if you are going to configure RAID1.

Enabling RAID Feature by BIOS SETUP Utility

The two hard disk drives installed can be used either as a single disk or a RAID drive.

To configure a disk drives as RAID drive, you must specify the hard disk drive being connected to the onboard SATA connector as a RAID drive by using the BIOS SETUP Utility.

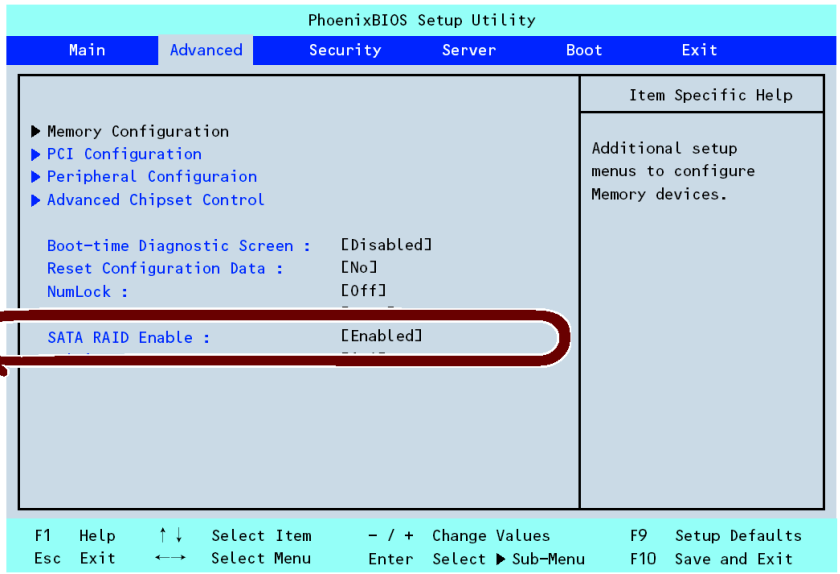
> **NOTE:** The factory-set value is to use the hard disk drive as a single disk drive.

To change settings by BIOS SETUP Utility:

1. Start the BIOS SETUP utility.

   See "Starting SETUP Utility" described earlier.

2. Select [Advanced] → [SATA RAID Enable] → [Enabled].



3. Select [Exit] → [Exit Saving Changes] to save the settings and exit the SETUP utility.

This completes the setting. When the setting has been changed, POST will display a message to prompt you to start [Array Configuration Utility (ACU)] every time the server is started.

Press <Ctrl><A> for Adaptec RAID Configuration Utility

Start the utility to configure the RAID drive as needed. See the description below for details.

RAID Configuration by Array Configuration Utility (ACU)

This section describes how to configure the RAID by using the "Array Configuration Utility (ACU)" that can be called from POST.

> **NOTE:** You can configure the RAID drive by using Express Setup of NEC EXPRESSBUILDER. See Chapter 6 for details.

Running the Array Configuration Utility (ACU)

To start ACU:

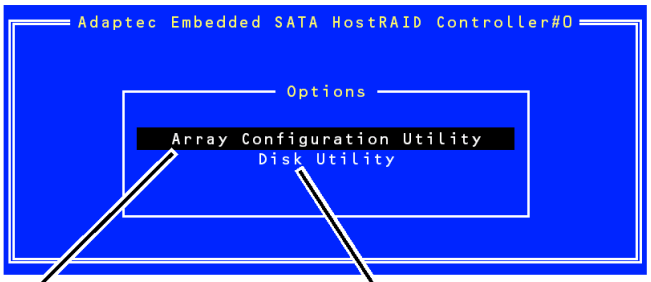
> **NOTES:**
>
> - Make sure that the BIOS has been changed according to "Enabling RAID Feature by BIOS SETUP Utility".
> - To start the ACU from management PC via serial (direct) connection or via network, see also "NEC EXPRESSBUILDER" in Chapter 6.

1. Start the server.
2. To run ACU, press **Ctrl** + **A** when prompted by the following message during the system startup:

   Press <Ctrl><A> for Adaptec RAID Configuration Utility

   > **NOTE:** If it takes a long time until a message appears on the display unit, press **Ctrl** + **A** three to five seconds after power-on.

   After a while, the ACU menu appears.



To change or delete RAID configuration

To perform low-level formatting or verification of RAID drive

Configuring RAID

Take the following steps to configure RAID.

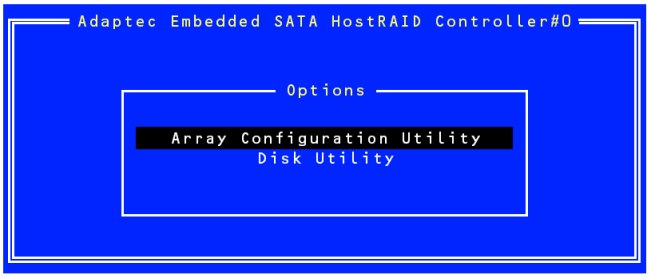
IMPORTANT:

- Once the array is created and its properties are assigned, you cannot change the array properties.
- Be sure to set Bootable according to "Managing Arrays" using the BIOS SETUP utility. Otherwise, the memory dump cannot be collected at system failure, or other problem will be raised.

1. Start the ACU.

   See "Running the Array Configuration Utility (ACU)" described earlier.

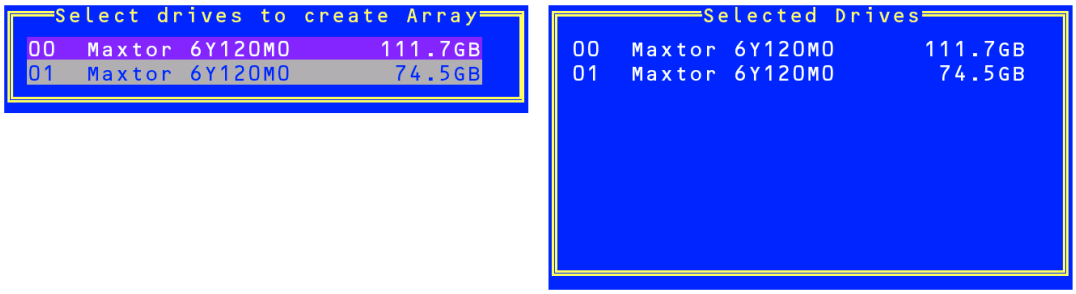
2. Use the cursor key to select [Array Configuration Utility] from the Options menu, and press **Enter.**



3. From the main menu, select [Create Array] and press **Enter**.

4. Select two hard disk drives for RAID and press **Insert**.

When you press **Insert**, the selected drive is added to the [Selected Drives] list box at right. If you wish to delete any drive, select the one from the list box at left, and press **Delete**. Then, the drive will be erased from the list box at right.



NOTES:

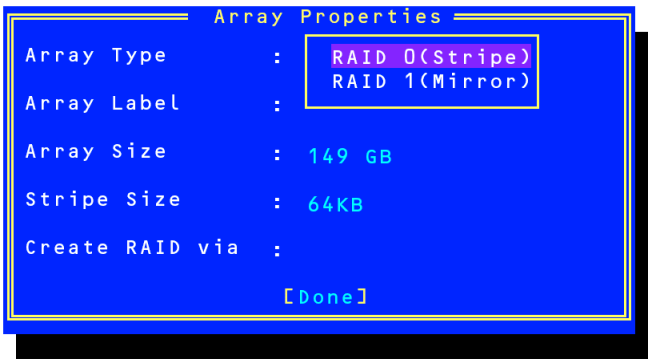
- Up to two hard disk drives can be connected to the onboard SATA connector of the server. RAID configuration requires two or more hard disk drives. Therefore, select two hard disk drives displayed in the list.
- The grayed-out hard disk drive indicates the disk with no usable disk, or uninitialized disk. Press **Esc** several times to exit this menu. See "Initializing Hard Disk Drives" described later.

5. Press **Enter.**

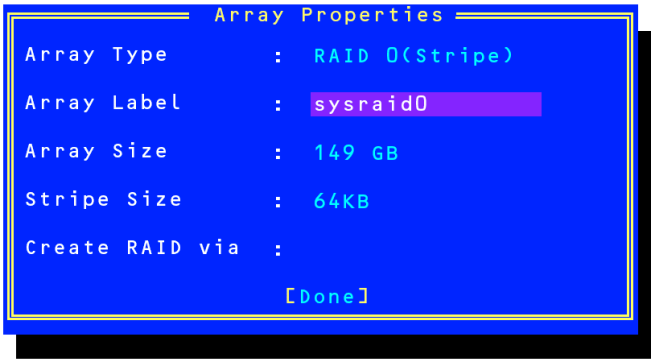
[Array Properties] for detailed setting of RAID appears.

6. Select the desired RAID level using the cursor key and press **Enter.**

Select either RAID0 (striping) or RAID1 (mirroring).

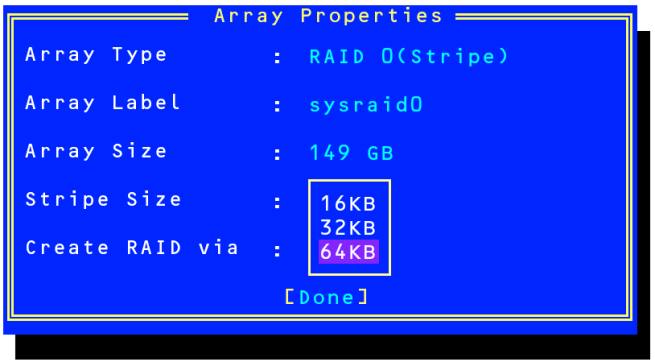


7. Enter the volume label for the RAID drive to be created, and press **Enter.**

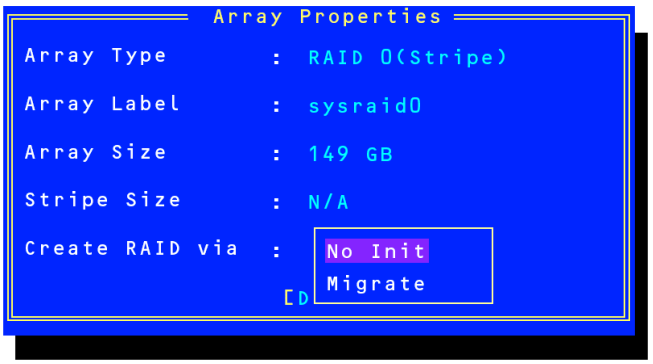


8. For RAID0, select the desired stripe size and press **Enter**. Available stripe sizes are 16, 32, and 64 KB (default).

NOTE: NEC recommends that you use the default 64KB for stripe size.



9. Select the creation method from [Create RAID via] and press **Enter**.



Create RAID via allows you to select between the different creation methods for RAID0 and RAID1. The following table gives examples of when each is appropriate.

RAID level	Create RAID via	How to create
RAID0	No Init	Creates a RAID0 on new drives.
RAID0	Migrate	Adds a new drive to the existing drive that contains data (migration). The server does not support [Migrate] feature.
RAID1	Build*	Copy the data in the existing drive and creates RAID1 drive.
RAID	Clear	Clears all the data in the drive and creates new RAID1 drive.
RAID1	Quick Init	Fastest way to create a RAID1 drive.

* When you start creating RAID, a window to select the copy source drive (existing drive) appears. The data in the selected drive is copied to the new drive to configure RAID. Note that the data in the destination drive is erased.

IMPORTANT: The server does not support Migrate option.

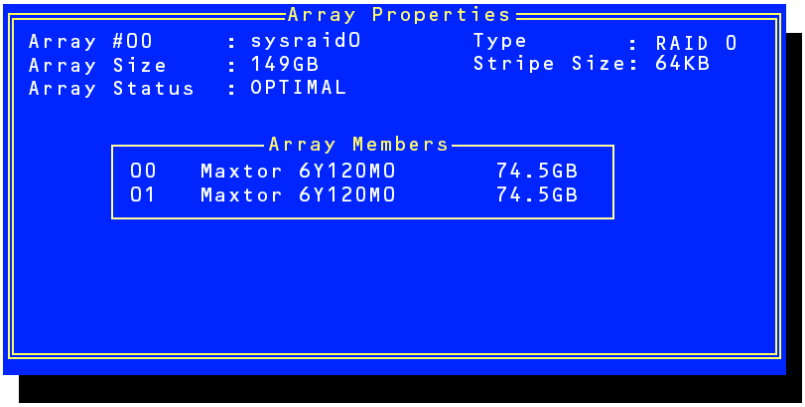
NOTES:

- Before adding a new drive to an existing array, back up any data contained on the new drive. Otherwise, all data will be lost.
- If you stop the Build process on a RAID1 from ACU, you can only restart it from Adaptec Storage Manager - Browser Edition or Adaptec Storage Manager.
- A RAID1 created using the Quick Init option may return some data miscompares if you later run a consistency check. This is normal and is not a cause for concern.
- The ACU allows you to use drives of different sizes in a RAID1. During a build operation however, only the smaller drive can be selected as the copy source or first drive.
- We do not recommend that you build an array on Windows dynamic disks (volumes), as it will result in data loss.

10. Select a source drive from the [Select Source Drive] list box and press **Enter**.

11. When you are finished, select [Done] and press **Enter**.

Creation of RAID starts. Wait for a while.



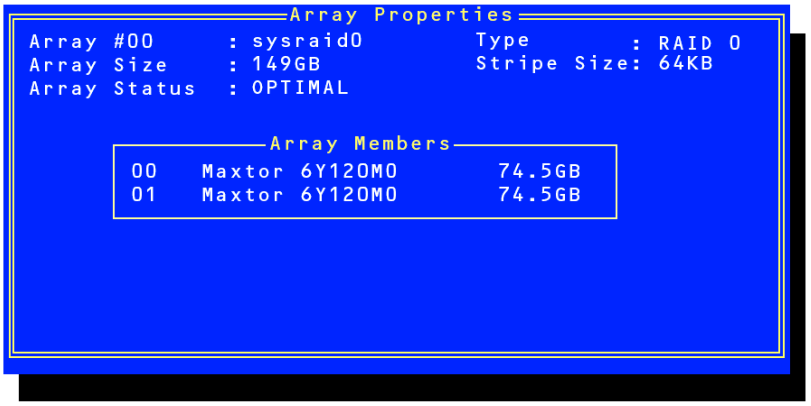
Managing Arrays

Use the [Manage Arrays] option in the main menu that appears by selecting [Option] → [Array Configuration Utility] to view array properties and delete arrays.

- Viewing Array Properties

  Select [Manage Arrays] on Main Menu and press **Enter** to display the list of RAID drives.

  From the [List of Arrays] dialog box, select the RAID drive you want to view and press **Enter**. The [Array Properties] dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.



  Press **Esc** to return to the previous menu.

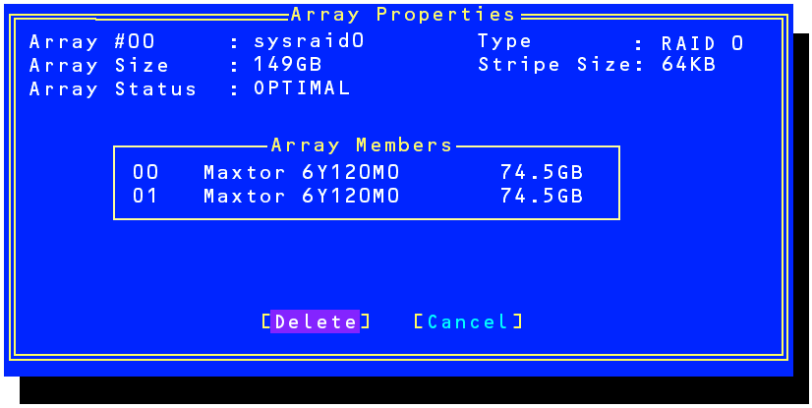
- Deleting Arrays

  IMPORTANT: Back up the data on an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.

  From the main menu, select [Manage Arrays] and press **Enter**. A list of RAID drives that configure the array is displayed.

To delete an array:

1. Select the array you wish to delete and press **Delete**.
2. Select [Delete] on [Array Properties] dialog box and press **Enter**.



The confirmation prompt is displayed.

NOTE: The number and contents depends on RAID level.

3. Press **Y** to delete the array or partition or **N** to return to the previous menu.
4. Press **Esc** to return to the previous menu.

Initializing Hard Disk Drive

Hard disk drives must be initialized before they can be used as RAID drive. (An uninitialized disk does not appear in the disk selection list for creating a new array or it appears grayed out.)

IMPORTANT:

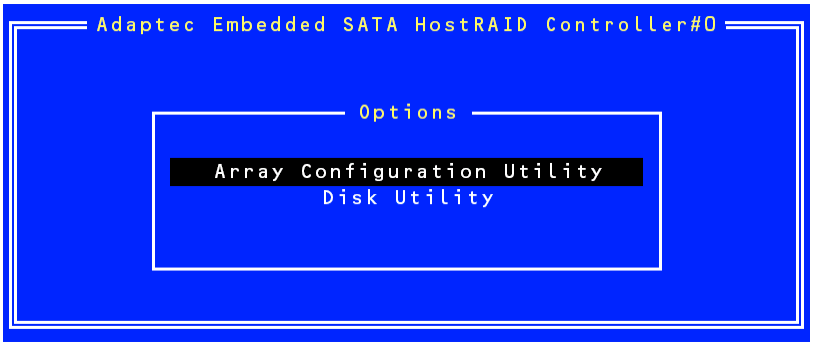
- Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible.
- If the drive that has been used in an array is initialized, you may not be able to return the disk to the original array again.
- Do not initialize a disk that is part of a boot array. The system will fail to start.

To initialize hard disk drives:

1. Start the ACU.

   See "Running the Array Configuration Utility (ACU)" described earlier.

2. From the Options menu, select [Array Configuration Utility] and press **Enter**.



3. Select [Initialize Drives] from the main menu and press **Enter**.

4. Use the cursor keys to select the hard disk drive you wish to initialize and press **Insert**.
5. Repeat Step 4 so that both drives to be initialized are selected.
6. Press **Enter**.
7. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type **Y** to continue.

Using the Disk Utilities

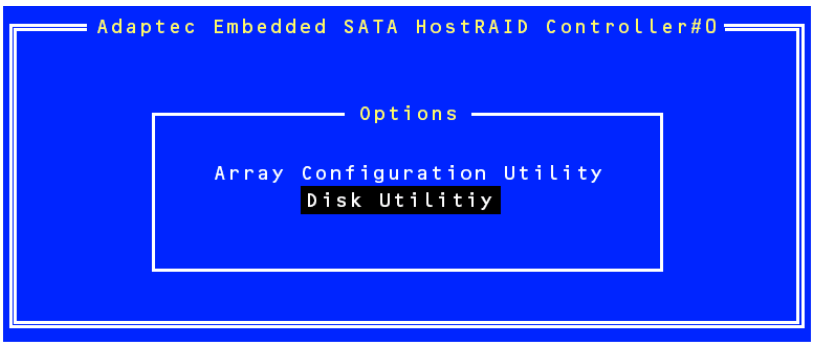
The Disk Utilities enable you to low-level format or verify the media of your Serial ATA hard disk drives.

To access the disk utilities:

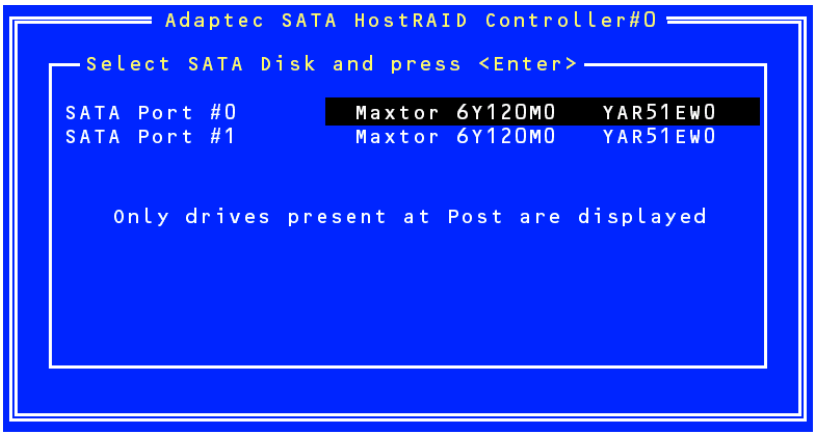
1. Start the ACU.

   See "Running the Array Configuration Utility (ACU)" described earlier.

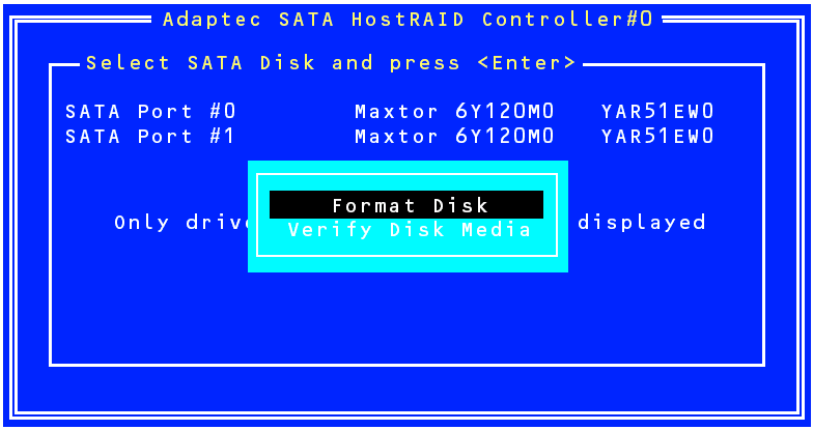
2. From the Options menu, select [Disk Utilities] using the cursor key and press **Enter**.



3. Select the desired hard disk drive and press **Enter**.


Adaptec SATA HostRAID Controller#0
Select SATA Disk and press <Enter>
SATA Port #0 Maxtor 6Y120M0 YAR51EW0
SATA Port #1 Maxtor 6Y120M0 YAR51EW0
Only drives present at Post are displayed

4. Select the desired menu to execute and press **Enter**.



– Format Disk

Starts a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

IMPORTANT: Low-level formatting erases all data on the drive. Be sure to back up your data before performing this operation.

– Verify Disk Media

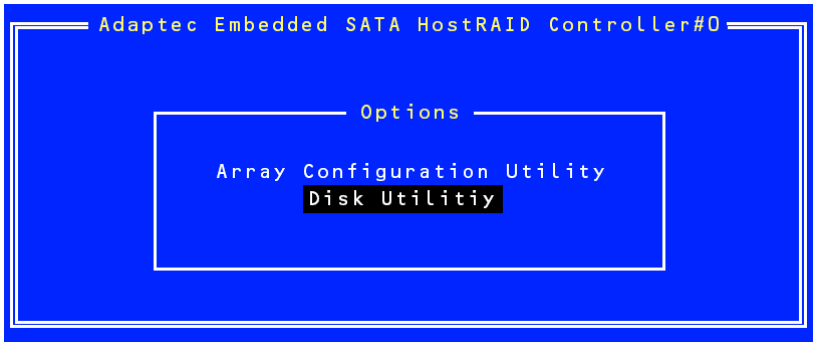
Scans the media in a disk drive for defects.

Setting of Bootable

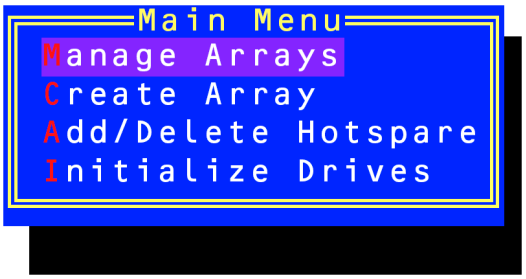
1. Start the ACU.

   See "Running the Array Configuration Utility (ACU)" described earlier.

2. Select [Options] → [Array Configuration Utility] by using the cursor keys, and press **Enter.**



3. Select [Manage Array] from Main Menu, and press **Enter.**



4. All the created arrays are displayed in [List of Arrays]. Press Ctrl and B. The confirmation message appears. Select [Y].

   [Mark Bootable] is set.

5. After making sure that [Mark Bootable] has been set, exit the Array Configuration Utility and reboot the server.

   You will see an asterisk [*] at the front of the array to which the [Mark Bootable] has been set in [List of Arrays] dialog box.

   The setting becomes valid after restarting the system.

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Chapter 5

Installing the Operating System with Express Setup

This section describes information on using Express Setup to install and configure the following operating systems to the server.

- Microsoft® Windows Server™ 2003 R2 Standard Edition / Microsoft® Windows Server™ 2003 R2 Enterprise Edition / Microsoft® Windows Server™ 2003 Standard Edition / Microsoft® Windows Server™ 2003 Enterprise Edition
- Microsoft® Windows® 2000 Server / Microsoft® Windows® 2000 Advanced Server

To use the server with the other operating systems described in this section, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See Chapter 4 for detail.

This chapter also includes information on configuring the HostRAID™ drive used with the onboard serial ATA interface. Refer to the end of this chapter for detail.

About Express Setup

"Express Setup" helps you to install the Windows Operating System.

The setup automatically configures the RAID system and installs the Operating System and some management software.

IMPORTANT: Executing the Express Setup erases all data on the hard disk drive.

NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

You can also use "Configuration disk" at "Express Setup" in order to save or backup parameters for installation.

The Configuration disk is able to have some parameters files that include the configuration information for the server setup.

If you want to set up the server as before, execute the Express Setup with the parameters file you have saved before.

NOTES:

- The parameters file is not mandatory to set up the system.
- If you want to create a parameters file, have a blank floppy disk(MS-DOS 1.44MB format) ready.
- If you want to use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards, a parameters file is mandatory.
- You can create a parameters file in advance using "Configuration Diskette Creator" included in NEC EXPRESSBUILDER.

Microsoft Windows Server 2003

This subsection provides information on installing Microsoft® Windows Server™ 2003 in the Server. Read instruction in this section before proceeding the installation.

NOTES:

- Express Setup does not support the installation of Windows Server 2003 x64 Editions. If you want to install it, see Appendix D.
- If you install Windows Server 2003 without using Express Setup, see Appendix E.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows Server 2003 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows Server 2003 R2 Standard Edition / Microsoft Windows Server 2003 R2 Enterprise Edition / Microsoft Windows Server 2003 Standard Edition / Microsoft Windows Server 2003 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

On installing other OS, contact sales dealer or the maintenance service representative.

BIOS Settings

Before installing Windows Server 2003, confirm if the BIOS settings are correct.

See Chapter 4 to confirm the settings.

NEC ESMPRO Agent

NEC ESMPRO Agent requires to install the necras.sys driver on your Windows system.

If you install the Windows without using the Express Setup, run the "Update Express5800 system" in Master Control Menu.

Optional Board Supported by NEC EXPRESSBUILDER

NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards;

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

<SCSI Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - N8103-86 Disk Array Controller (0ch)
  - Adaptec HostRAID(SCSI) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

<SATA Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SATA) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

Windows Server 2003

Express Setup can install Windows Server 2003 operating system. Confirm below notes before installing the Windows.

IMPORTANT:

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- The document for installing Windows Server 2003 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows Server 2003 on this model.
- After completing Express Setup, see "Setting for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows Server 2003 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Connecting MO Device

If you operate installing Windows Server 2003 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Connecting Hard Disk Drive

Connect the hard disk drive that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix D).

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 2900MB (Only Windows Server 2003) 3500MB (Windows Server 2003 with Service Pack1) 4400MB (Windows Server 2003 + Service Pack1 CD-ROM)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

2900MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 4192MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

Re-installing to the hard disk drive which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2003 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

About Maintenance Partition (the area displayed as "MAINTE_P")

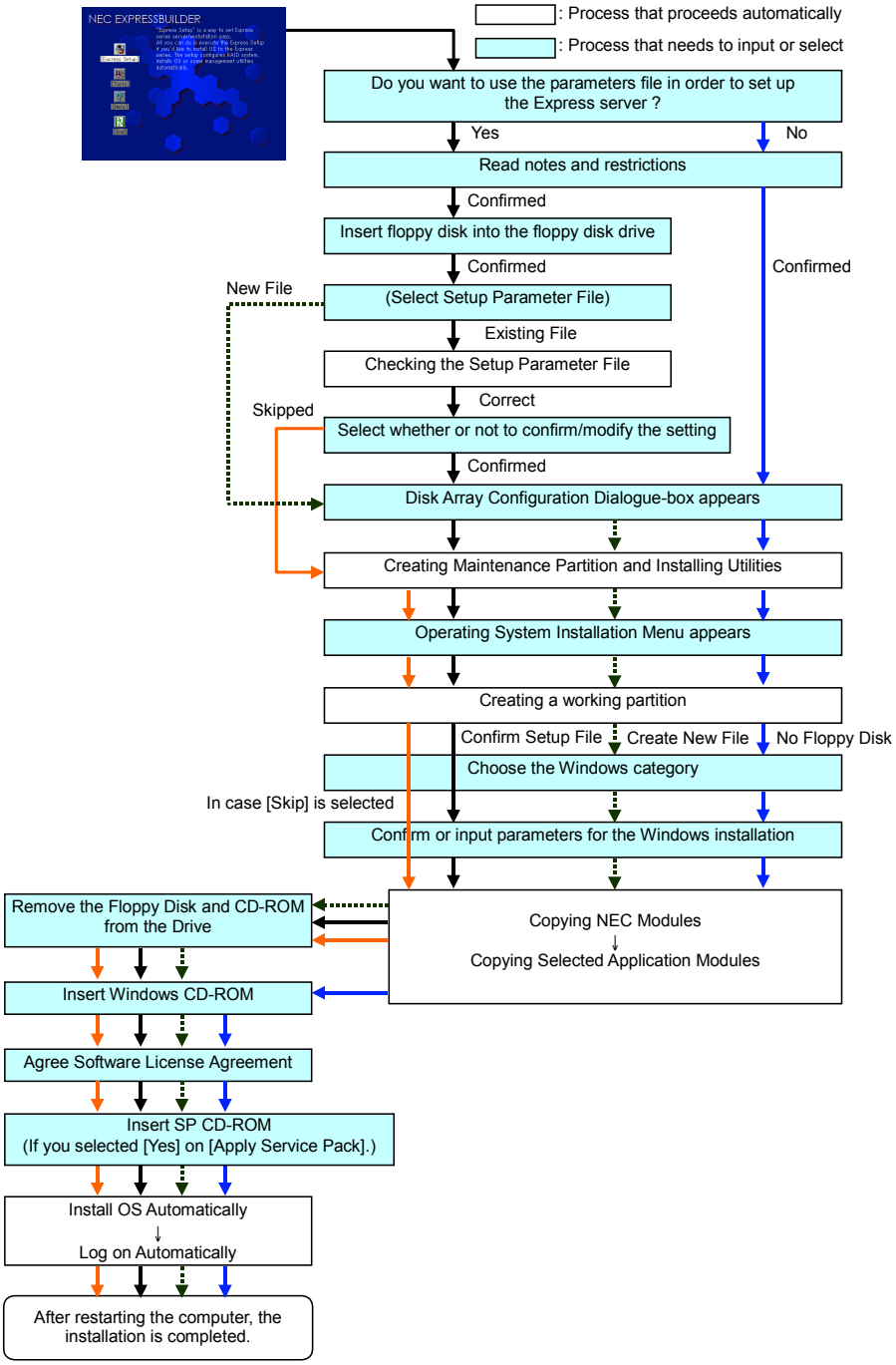
The maintenance partition for server maintenance is reserved in the head of Hard Disk Drive (a partition of approximately 55MB).

This area is for saving some maintenance utilities.

Do not delete the maintenance partition.

The Flow of Setup

This section shows the flow of the Express setup.


NEC EXPRESSBUILDER
: Process that proceeds automatically
: Process that needs to input or select
Do you want to use the parameters file in order to set up the Express server ?
Yes
No
Read notes and restrictions
Confirmed
Insert floppy disk into the floppy disk drive
Confirmed
Confirmed
New File
(Select Setup Parameter File)
Existing File
Checking the Setup Parameter File
Correct
Skipped
Select whether or not to confirm/modify the setting
Confirmed
Disk Array Configuration Dialogue-box appears
Creating Maintenance Partition and Installing Utilities
Operating System Installation Menu appears
Creating a working partition
Confirm Setup File
Create New File
No Floppy Disk
Choose the Windows category
In case [Skip] is selected
Confirm or input parameters for the Windows installation
Remove the Floppy Disk and CD-ROM from the Drive
Copying NEC Modules
↓
Copying Selected Application Modules
Insert Windows CD-ROM
Agree Software License Agreement
Insert SP CD-ROM
(If you selected [Yes] on [Apply Service Pack].)
Install OS Automatically
↓
Log on Automatically
After restarting the computer, the installation is completed.

Installing the Windows Server 2003

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

> **NOTE:** Prepare a floppy disk to use as Configuration Disk if you want to save the parameters or use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards. When using the floppy disk, the Express setup can continue the setup without specifying the parameters.

1. Turn the power of peripheral device on, and then turn on the server.

   NOTES:
   - If you operate installing Windows Server 2003 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
   - Install the OS before connecting another hard disk drive.
   - If you create multiple logical drives in your system, refer to "Reinstalling the operation system when multiple logical drives exist" (Appendix D).

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
3. Press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER.

   The system boots from the CD-ROM and NEC EXPRESSBUILDER starts.
4. Click [Express Setup].
5. The message, "Do you want to use the parameters file in order to set up the Express server or workstation ?", appears.

   If you want to use the parameters file, click [Yes].

   If not, click [No].
6. "NOTE" appears. Click [Confirm] after reading that.

   > **NOTE:** If some operating system has been installed on the hard disk drive already, the message which asks if you continue the installation appears.

7. If you select "Yes" at step 5, place a floppy disk into the floppy disk drive mounted on the server.

If not, go on the next step.

> **NOTE:** If you set the floppy disk at this step, do not remove the floppy disk from the server until the message as removing the floppy disk appears.

[Using the existing Configuration Disk]

The parameters files in the floppy disk is listed in dialog-box.

1) Select a parameters file to use in the Express Setup.

   After the parameters file is specified, the message "Do you want to review or modify the Setup File parameters?" appears.

2) If you want to modify or confirm the parameters file, click [Review]. If not, click [Skip].

   Click [Review] → Go on the next step.

   Click [Skip] → Go on the step 9.

> **NOTE:** If you do not use disk array controller, go on the step 9. After that, the dialog-box appears.

[Using a blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

   The dialog box appears.

2) Input the file name and click [Use].

8. Confirm or modify the parameters of disk array configuration.

> **NOTE:** If you do not use disk array controller, go on the next step.

If a Disk array controller is connected to the server or the HostRAID is enabled, the [Configure RAID] dialog-box appears. Confirm the parameters, modify if necessary, and then click [OK].

When the dialog-box is closed, the Express setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

9. Select the installing Operating system.

Select "Windows" from the menu.

10. Select the Windows family.

Select "Microsoft Windows Server 2003 Standard Edition Microsoft Windows Server 2003 Enterprise Edition" category.

NOTE: If you select "Skip" at step 8, this menu does not appear. Go on the step 13.

11. Next, [Basic Information] wizard appears. Confirm the parameters, modify if necessary, and then click [Next].

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the parameters each time if necessary.

IMPORTANT:

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
- If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk drive to install Windows Server 2003.
- You can not go to the next screen if the specification is incorrect.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the OS. [Cancel] exists only in [Basic Information] screen.
- If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

12. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

> **NOTE:** This function requires mounting a floppy disk drive on your server.

13. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

Insert Windows Server 2003 CD-ROM into the CD-ROM drive.

[Agree Software License Agreement] screen appears.

14. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

> **IMPORTANT:**
>
> - If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
> - If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.

15. If you selected [Yes] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) Follow the message to take Windows Server 2003 CD-ROM out of the CD-ROM drive.
2) Follow the message to insert Windows Server 2003 Service Pack 1 or later into the CD-ROM drive.

Windows Server 2003 and the specified application will be installed automatically and logon to the system. Install and configure the device drivers.

16. If you install Microsoft Windows Server 2003 R2, insert Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 into the CD-ROM drive after the OS installation.

Hereinafter, proceed operations according to the message.

When the installation has finished, remove Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 from the CD-ROM drive, and restart the system.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSET.EXE" in the following directory.

   <CD-ROM DriveLetter>:\WINNT\DOTNET\BC5\PROSET\WS03XP32

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet for Wired Connections] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

NOTE: We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet)that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-86/88/111/103/109/112/113/115), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/88/111)

"<CD-ROM Drive Letter>:\WINNT\DOTNET\BC5\PRO100\WS03XP32"

In case of utilizing (N8104-103/109/112/113/115)

"<CD-ROM Drive Letter>:\WINNT\DOTNET\BC5\PRO1000\WS03XP32"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and Double-Click [(Network Adapter Name)].

   [(Network Adapter Name) Properties] appears.

   NOTE: [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location(Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(N8104-86/88/111)], specify
   [<CD-ROM driveletter>:\WINNT\DOTNET\BC5\PRO100\WS03XP32].

   And when using [(N8104-103/109/112/113/115)], specify
   [<CD-ROM driveletter>:\WINNT\DOTNET\BC5\PRO1000\WS03XP32].

   Then click [Next].
7. Click [Finish].

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.

   The [Intel(R) PROSet for Wired Connections] dialog box appears.

2. Put the mouse cursor on "Intel(R) PRO/1000 MT Dual Port Network Connection" in the list and right-click.

   Pull-down menu appears.

3. Select [Add to Team>] and then click [Create New Team...].

   The [Teaming Wizard] dialog box appears.

4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Installing SCSI Controller Driver (N8103-65F)

If you utilize SCSI controller driver (N8103-65F), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-75)

If you utilize SCSI controller driver (N8103-75), install it according to the following procedure:

<In the case of use of Windows Server 2003 SevicePack1 or Windows Server 2003 R2>

If you utilize SCSI controller driver (N8103-75), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

<In the case of Windows Server 2003 which has not installed SevicePack1>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools]→ [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [Adaptec SCSI Card 29320ALP - Ultra320 SCSI] (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56/-95/N8190-126)

If you utilize SCSI controller driver (N8103-56/-95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing Disk Array Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003, connect the controller and take the following steps to install the driver:

<In the case of use of Windows Server 2003 SevicePack1 or Windows Server 2003 R2>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

<In the case of Windows Server 2003 which has not installed SevicePack1>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

* For the graphics accelerator driver, the use of a remote KVM console that installs the advanced N8115-02 remote management card is supported by the standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\DOTNET\VIDEO\SETUP.EXE
4. Follow the message to continue the installation.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

Available Switch Options for Windows Server 2003 Boot.ini File

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

  "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003" /fastdetect
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect
   /PAE
   C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

   The [System Properties] dialog box appears.

2. Select [Advanced] tab.
3. Click [Settings] on the [Startup and Recovery] group box.

IMPORTANT:

Windows Server 2003 x64 Editions

- To specify "Complete Memory Dump" to write the debug information is recommended.
  If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 1MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2003

- To specify "Complete Memory Dump" to write the debug information is recommended.
  If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB" (In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.

   e.g. Write the debug information in D drive write the file name "MEMORY.DMP".

   D:\MEMORY.DMP

5. Click [Settings] on the [Performance] group box.

   The [Performance Options] window appears.

6. Click [Advanced] tab on the [Performance Options] window.

7. Click [Change] on the [Virtual memory] group box.

8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

   IMPORTANT:

   - The above-mentioned paging file size is recommended for collecting debug information (memory dump).
     The paging file with initial size large enough to store the dump file in the boot drive is required.
     Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
   - For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
   - In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

   The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify network pass. Specify the pass on local computer.
4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble. To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add/Remove Programs].

   The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows Server 2003 CD-ROM into CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System - Installing Service Pack -

IMPORTANT: If you install Windows Server 2003 CD-ROM which contains Service Pack 1 to your system, you do not have to apply Service Pack 1 again.

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup] in [Master Control Menu] screen appears, so left-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the message to continue the setup process.

Making Backup Copies of System Information

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Exceptional Setup

This section explains how to set up the server by the exceptional way. You usually do not have to do as follows. If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed in Chapter 5, set the server as follows. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass storage device not to be supported by Express Setup

If you want to install the Operating system when the server has new mass storage device not to be supported by NEC EXPRESSBUILDER, follow the steps below.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.
3. Boot the system from NEC EXPRESSBUILDER CD-ROM.
4. (a) When the message "Do you want to use the parameters file..." appears, select "Yes"..
   (b) When the dialog of Disk array configuration appears, check "Use Existing Array".
   (c) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the Express Setup.

   Insert the floppy disk attached the mass storage device into the floppy disk drive.

   Continue the Express Setup, referring to messages displayed on the display.

Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 in the server. Read instruction in this section before proceeding the installation.

> **NOTE:** If you install Windows 2000 without using Express Setup, see Appendix E.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows 2000 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows 2000 Server / Microsoft Windows 2000 Advanced Server (hereinafter, referred to as "Windows 2000")

On installing other OS, contact sales dealer or the maintenance service representative.

BIOS Settings

Before installing Windows 2000, confirm if the BIOS settings are correct. On the BIOS settings, there are some items to specify for the new functions provided by Windows 2000 (Plug and Play, support for USB interface and so on). See Chapter 4 to confirm the settings.

NEC ESMPRO Agent

NEC ESMPRO Agent requires to install the necras.sys driver on your Windows system.

If you install the Windows without using the Express Setup, run the "Update Express5800 system" in Master Control Menu.

Optional Board Supported by NEC EXPRESSBUILDER

NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards;

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

<SCSI Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - N8103-86 Disk Array Controller (0ch)
  - Adaptec HostRAID(SCSI) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

<SATA Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SATA) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

Windows 2000

Express Setup can install Windows 2000 operating system. Confirm below notes before installing the Windows.

IMPORTANT:

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
- The document for installing Windows 2000 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows 2000 on this model.
- After completing Express Setup, see "Setting for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows 2000 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Connecting MO Device

If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Connecting Hard Disk Drive

Connect the hard disk drive that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix E).

About Maintenance Partition (the area displayed as "MAINTE_P")

The maintenance partition for server maintenance is reserved in the head of Hard Disk Drive (a partition of approximately 55MB).

This area is for saving some maintenance utilities.

Do not delete the maintenance partition.

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 1000MB
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

1000MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 2292MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

NOTES:

If you want to install using Express Setup, calculate the minimally required partition size as follows:

- If you do not apply Windows 2000 Service Pack
  The larger value of either one: 'Minimum Partition Size' described above, or '4095MB'.
- If you want to apply Windows 2000 Service Pack
  The larger value of either one: 'Minimum Partition Size' described above + 850MB or '4095MB'.

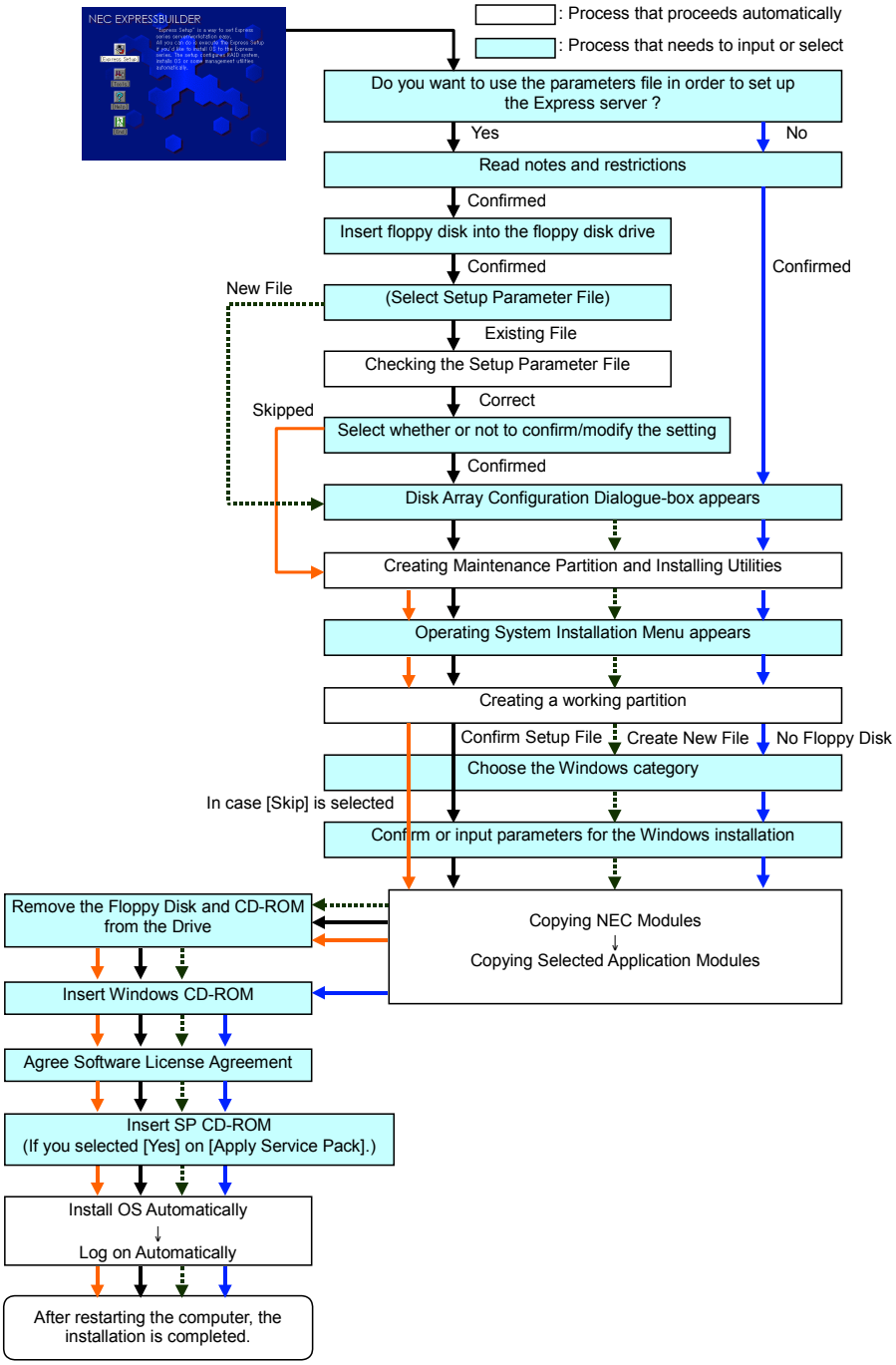
Re-installing to the hard disk drive which has been upgraded to Dynamic Disk

You cannot re-install Windows 2000 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

The Flow of Setup

This section shows the flow of the Express Setup.


NEC EXPRESSBUILDER
: Process that proceeds automatically
: Process that needs to input or select
Do you want to use the parameters file in order to set up the Express server ?
Yes
No
Read notes and restrictions
Confirmed
Insert floppy disk into the floppy disk drive
Confirmed
Confirmed
New File
(Select Setup Parameter File)
Existing File
Checking the Setup Parameter File
Correct
Skipped
Select whether or not to confirm/modify the setting
Confirmed
Disk Array Configuration Dialogue-box appears
Creating Maintenance Partition and Installing Utilities
Operating System Installation Menu appears
Creating a working partition
Confirm Setup File
Create New File
No Floppy Disk
Choose the Windows category
In case [Skip] is selected
Confirm or input parameters for the Windows installation
Remove the Floppy Disk and CD-ROM from the Drive
Copying NEC Modules
↓
Copying Selected Application Modules
Insert Windows CD-ROM
Agree Software License Agreement
Insert SP CD-ROM
(If you selected [Yes] on [Apply Service Pack].)
Install OS Automatically
↓
Log on Automatically
After restarting the computer, the installation is completed.

Installing the Windows 2000

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

> **NOTE:** Prepare a floppy disk to use as Configuration Disk if you want to save the parameters or use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards. When using the floppy disk, the Express setup can continue the setup without specifying the parameters.

1. Turn the power of peripheral device on, and then turn on the server.

   NOTES:

   - If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
   - Connect the hard disk drive that OS is not going to be installed after installing OS.
   - If you create multiple logical drives in your system, refer to "Reinstalling the operation system when multiple logical drives exist" (Appendix D).

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
3. Press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER.

   The system boots from the CD-ROM and NEC EXPRESSBUILDER starts.
4. Click [Express Setup].
5. The message, "Do you want to use the parameter file in order to set up the Express Server or Workstation?", will be displayed.

   If you want to use the parameters file, click [Yes].

   If not, click [No].
6. "NOTE" appears. Click [Confirm] after reading that.

   > **NOTE:** If some operating system has been installed on the hard disk drive already, the message which asks if you continue the installation appears.

7. If you select "Yes" at step 5, place a floppy disk into the floppy disk drive mounted on the server.

If not, go on the next step.

> **NOTE:** If you set the floppy disk at this step, do not remove the floppy disk from the server until the message as removing the floppy disk appears.

[Using the existing Configuration Disk]

The parameters files in the floppy disk is listed in dialog-box.

1) Select a parameters file to use in the Express Setup.

   After the parameters file is specified, the message "Do you want to review or modify the Setup File parameters?" appears.

2) If you want to modify or confirm the parameters file, click [Review]. If not, click [Skip].

   Click [Review] → Go on the next step.

   Click [Skip] → Go on the step 9.

> **NOTE:** If you do not use disk array controller, go on the step 9. After that, the dialog box appears.

[Using a blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

   The dialog-box appears.

2) Input the file name and click [Use].

8. Confirm or modify the parameters of disk array configuration.

> **NOTE:** If you do not use disk array controller, go on the next step.

If a Disk array controller is connected to the server or the HostRAID is enabled, the [Configure RAID] dialog box appears. Confirm the parameters, modify if necessary, and then click [OK].

When the dialog-box is closed, the Express setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

9. Select the installing Operating system.

Select "Windows" from the menu.

10. Select the Windows family.

Select "Microsoft Windows 2000 Server / Microsoft Windows 2000 Advanced Server" category.

NOTE: If you select "Skip" at step 8, this menu does not appear. Go on the step 13.

11. Next, [Basic Information] wizard appears. Confirm the parameters, modify if necessary, and then click [Next].

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the parameters each time if necessary.

IMPORTANT:

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
- If "Create New Partition" at "New/Existing RAID Configuration" is selected, do not specify the value for the partition more than the actual area size.
- If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows 2000 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk drive to install Windows 2000.
- You can not go to the next screen if the specification is incorrect.

NOTES:

- If you click [Cancel] in [Basic Information] screen, the screen will go back to select the OS. [Cancel] exists only in [Basic Information] screen.
- If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

12. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

NOTE: You can use this function only when the floppy disk drive is attached to the system.

13. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

Insert Windows 2000 CD-ROM into the CD-ROM drive.

[Agree Software License Agreement] screen appears.

14. Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows 2000 will not be installed.
- If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.

15. If you selected [Yes] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) Follow the message to take Windows 2000 CD-ROM out of the CD-ROM drive.

2) Follow the message to insert Windows 2000 Service Pack 4 or later into the CD-ROM drive.

Windows 2000 and the specified application will be installed automatically and logon to the system. Install and configure the device drivers.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\BC5\PROSET\WIN2K

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex]value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet] on the [Control Panel] window.

   The [Intel(R) PROSet] dialog box appears. Double-click the [Intel(R) PROSet Wired] icon.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-86/88/111/103/109/112/113/115) install the driver stored in NEC EXPRESSBUILDER CD-ROM.

Refer to the re-installation procedure described in Appendix F.

Network Driver for (N8104-86/88/111)

[<CD-ROM DriveLetter>:\WINNT\W2K\BC5\PRO100\WIN2K]

Network Driver for (N8104-103/109/112/113/115)

[<CD-ROM DriveLetter>:\WINNT\W2K\BC5\PRO1000\WIN2K]

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] dialog box.
   The [Intel(R) PROSet for Wired Connections] dialog box appears.
2. Put the mouse cursor on "Intel(R) PRO/1000 MT Dual Port Network Connection" in the list and right-click. Pull-down menu appears.
3. Select [Add to Team] and then click [Create New Team...].
   The [Teaming Wizard] dialog box appears.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double click the SCSI Controller driver which Device Manager lists as unknown device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)

   [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56/-95/N8190-126)

If you utilize SCSI controller driver (N8103-56/-95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows 2000, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].
2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].
3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2000 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
4. When the [Driver Files Search Results] dialog box appears, click [Next].
5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

* For the graphics accelerator driver, the use of a remote KVM console that installs the advanced N8115-02 remote management card is supported by the standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\VIDEO\SETUP.EXE
4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue. If the dialog message "Direct X Ver.8 isn't installed." appears, select [continue] to continue.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

USB 2.0 Driver

USB 2.0 Driver is pre-installed.

When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

Available switch options for Windows 2000 Boot.ini file.

Many different switches will be available if you edit Boot.ini File.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 170756

  "Available Switch Options for the Windows NT Boot.ini File"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Programs], point to [Accessories], and then click [Notepad].
2. On the [File] menu, click [Open...].
3. In the [Open] dialog box, in the [Look in] drop-down list box, click "%systemroot%" drive.
4. In the [Open] dialog box, in the [Files of type] drop-down list box, click "All Files" and in the [File name] drop-down list box, enter "Boot.ini". And then, click [Open].

   The content of Boot.ini file will be displayed.
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(1)\WINNT
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server" /fastdetect
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server, PAE" /fastdetect /PAE
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

Setting for Solving Problems

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click [Advanced].

4. Click [Startup and Recovery].

5. Enter the location to write the debug information to the text box.

   e.g. Write the debug information in D drive with the file name "MEMORY.DMP".

   D:\MEMORY.DMP

IMPORTANT:

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB" (In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

6. Click [Performance Options].

7. Click [Change] on the [Virtual Memory] dialog box.

8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to the value larger than [Recommended Size], and click [Specify].

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump).
  The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
- In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

Windows 2000 Dr. Watson

Windows 2000 Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows 2000] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify network pass. Specify the pass on local computer.
4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble. To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add/Remove Programs].

   The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows 2000 CD-ROM into the CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System - Installing Service Pack -

IMPORTANT: This system does not support Windows 2000 Service Pack 1 - 3.
If you install Windows 2000 CD-ROM which contains Service Pack 4 to your system, you do not have to apply Service Pack 4 again.

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup] in [Master Control Menu] screen appears, so left-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the message to continue the setup process and apply Service Pack.

Making Backup Copies of System Information

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Exceptional Setup

This section explains how to set up the server by the exceptional way. You usually do not have to do as follows. If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed in Chapter 5, set the server as follows. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass storage device not to be supported by Express Setup

If you want to install the Operating system when the server has new mass storage device not to be supported by NEC EXPRESSBUILDER, follow the steps below.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.
3. Boot the system from NEC EXPRESSBUILDER CD-ROM.
4. (a) When the message "Do you want to use the parameters file..." appears, select "Yes".
   (b) When the dialog of Disk array configuration appears, check "Use Existing Array".
   (c) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the Express Setup.

   Insert the floppy disk attached the mass storage device into the floppy disk drive.

   Continue the Express Setup, referring to messages displayed on the display.

HostRAID

The following explains the overview of HostRAID and the setup procedure.

Overview of HostRAID

HostRAID provides RAID feature through the onboard serial ATA or SCSI interface in your system.

HostRAID consists of the driver that controls disk arrays and "Adaptec Storage Manager™ (hereinafter abbreviated to ASM) for Windows Server 2003 x64 Edition or that "Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) for Windows Server 2003 and Windows 2000. ASM and ASMBE are disk array management utilities.

The software products are mandatory for HostRAID to function normally. Be sure to install both software products (driver and utility). For the driver, refer to the setup procedure explained in this manual. For ASMBE, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide." For ASM, refer to the "Adaptec Storage Manager™ User's Guide."

Overview of the specifications

Hard disk drive:	SCSI HostRAID: Four hard disk drives for each channel + 2 spare drives SATA HostRAID: One hard disk drive for each channel (two hard disk drives max.)
RAID level:	SCSI HostRAID: RAID0 or RAID1 SATA HostRAID: RAID0 or RAID1
Operating system:	Microsoft Windows Server 2003 Standard x64 Editions/Enterprise x64 Editions Microsoft Windows Server 2003 Standard Edition/Enterprise Edition Microsoft Windows 2000 Server/Advanced Server
Configuration Method of disk arrays:	BIOS utility, NEC EXPRESSBUILDER and ASMBE or ASM

Features

- HostRAID supports the hot swap rebuild function for the hot plug insertion (Hot-Swap) of hard disk drives (when SCSI HostRAID is installed).
- HostRAID enables the BIOS utility to select the disk array/standard SCSI for each channel (when SCSI HostRAID is installed).
- HostRAID enables the BIOS utility to select the disk array/standard SATA for each channel (when SATA HostRAID is installed).
- Since the JAVA-based management utility ASMBE uses the browser (IE5.5 or later), the software does not need to be installed into each client PC for management. (The software must be installed in each server.)

Notes

The following explains general notes on HostRAID:

<SCSI HostRAID>

- Only a hard disk drive can be connected to a channel with which HostRAID is enabled through SCSI BIOS.
- To connect a device other than a hard disk drive, disable HostRAID and use it as the standard SCSI.
- If you replace a hard disk drive being used with HostRAID, let 60 seconds or more pass after removing the hard disk drive, and then install a new hard disk drive.
- If the interval is too short, an unexpected event may occur. (You should install a new hard disk drive after confirming the removal of the old hard disk drive on the ASMBE or ASM window.)
- After rebuilding by using hot spare, do the rebuilding again to make the installation positions of hard disk drives and the configuration of an array using the disks same as those before the configuration of the array. Without the operation, the boot priority may be changed. The priority can be changed by the SCSI*Select* Utility.
- The timeout message below may be recorded into the event log if I/O operation is delayed while HostRAID is running with a high load applied. However, HostRAID internal processing retries the I/O processing, and the delay does not influence AP and system operations.
  Event source: a320raid.sys
  Event ID: 9
  Description: The device \Device\Scsi\a320raid* did not respond within timeout period. (*: Arbitrary)
- When Hot Spare Rebuild is performed, please perform Rebuild again to become the original hard disk drive mounting position and the same position. If this work is not done, a boot priority may change. A boot priority can be changed in BIOS.
- To start the system from the created array, be sure to create a bootable array. See Chapter 4 "Boot Priority" in this manual.

  If you do not create a bootable array, the memory dump can not be collected when a trouble occurs.

<SATA HostRAID>

- Only use the HostRAID drive as a system drive.
- Only a hard disk drive can be connected to a channel with which HostRAID is enabled through the BIOS setup utility.
- To connect a device other than a hard disk drive, disable HostRAID and use it as the standard SATA.
- If you replace a hard disk drive being used with HostRAID, please replace the hard disk drive after power-off of the system. Be sure to check the PORT number of the hard disk drive to be replaced in ASMBE or ASM in advance.
- To start the system from the created array, be sure to create a bootable array. See Chapter 4 "Setting of Bootable" in this manual.

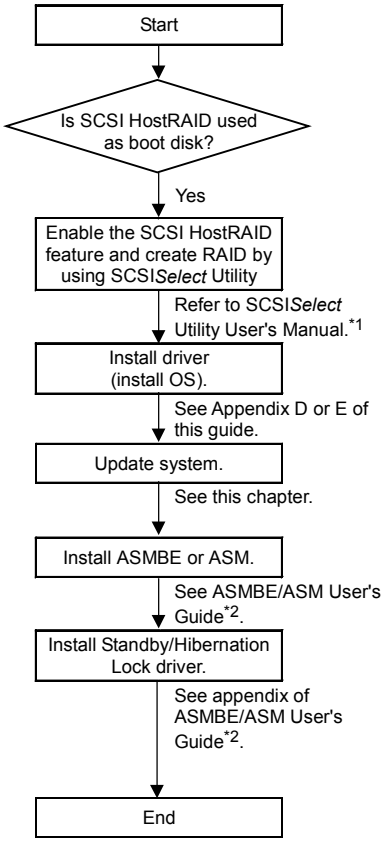
  If you do not create a bootable array, the memory dump can not be collected when a trouble occurs.
- SATA HostRAID does not support "Migration of hard disk drive (Migration)".

<Common NOTES>

- In addition to driver installation, ASMBE or ASM installation is mandatory for using HostRAID functions. For the installation of ASMBE or ASM, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide" or "Adaptec Storage Manager™," respectively.
- HostRAID does not permit the use of the standby/hibernation mode of ACPI functions.
- Use ASMBE or ASM to maintain HostRAID, but do not use any other utilities.
- Create at least one OS partition in the array you have created. If the OS partition does not exist, the Verify may be executed for the array at the system boot.
- If the following messages are included in the application log or log generated by the ASMBE, your RAID system operates normally.
  - Spare test failed for pool spare (bus=%2, ch=%3, id=%4)
  - Test of all spares completed with %1 failures

SCSI HostRAID Setup Flow

The flowchart below shows the SCSI HostRAID system setup procedure.


Start
Is SCSI HostRAID used as boot disk?
Yes
Enable the SCSI HostRAID feature and create RAID by using SCSI*Select* Utility
Refer to SCSI*Select* Utility User's Manual.*1
Install driver (install OS).
See Appendix D or E of this guide.
Update system.
See this chapter.
Install ASMBE or ASM.
See ASMBE/ASM User's Guide*2.
Install Standby/Hibernation Lock driver.
See appendix of ASMBE/ASM User's Guide*2.
End

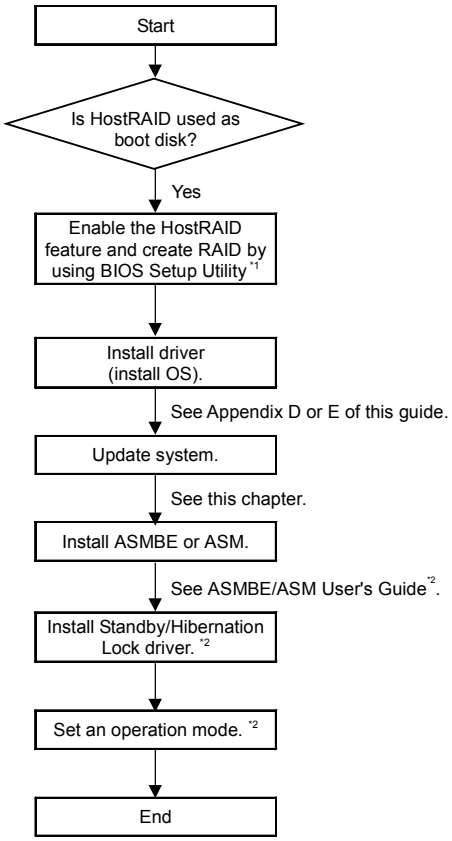
*1 You can create RAID by using the NEC EXPRESSBUILDER. In this case, only you need to do is to set the SCSI HostRAID feature to "Enabled" by using SCSI*Select* Utility.

*2 For Windows Server 2003 x64 Edition: Adaptec Storage Manager™ User's Guide
For Windows Server 2003 and Windows 2000: Adaptec Storage Manager™ - Browser Edition User's Guide

You may view or print these documents from the NEC EXPRESSBUILDER CD-ROM.

SATA HostRAID Setup Flow

The flowchart below shows the SATA HostRAID system setup procedure.


Start
Is HostRAID used as boot disk?
Yes
Enable the HostRAID feature and create RAID by using BIOS Setup Utility *1
Install driver (install OS).
See Appendix D or E of this guide.
Update system.
See this chapter.
Install ASMBE or ASM.
See ASMBE/ASM User's Guide *2.
Install Standby/Hibernation Lock driver. *2
Set an operation mode. *2
End

*1 See Chapter 4. You can create RAID by using the NEC EXPRESSBUILDER. In this case, only you need to do is to set the HostRAID feature to "Enabled" by using BIOS SETUP Utility.

*2 For Windows Server 2003 x64 Edition: Adaptec Storage Manager™ User's Guide
For Windows Server 2003 and Windows 2000: Adaptec Storage Manager™ - Browser Edition User's Guide

Migration of Hard Disk Drive (Migration)

When you want the system SCSI hard disk drive using SCSI controller on the I/O board migrate to RAID1 of SCSI HostRAID, the "Migration" must be executed.

For details, refer to "Express5800 SCSI HostRAID Migration procedure (Windows)" of online documents.

IMPORTANT: SATA Model does not support "Migration of hard disk drive (Migration)".

Chapter 6

Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER CD-ROM that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER.

NEC EXPRESSBUILDER

NEC EXPRESSBUILDER is an automated software integration tool to help simplify the process of installing and configuring your server. Shipped with all NEC servers, the NEC EXPRESSBUILDER CD-ROM provides a flexible, guided installation process for system administrators to install Microsoft Windows Server 2003, Microsoft Windows 2000 or other operating systems (contact your service representative for the server certified operating systems).

NOTE: Before using NEC EXPRESSBUILDER for initial setup, complete the hardware configuration.

NEC EXPRESSBUILDER includes two distinct programs. One can be booted under DOS for initial setup, and one is for use under Windows operating system.

- DOS-based with local console

  Used to set up the server at the first time. This program is also used to diagnose the server and to install/uninstall the management utilities on the maintenance partition of the system drive.

NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

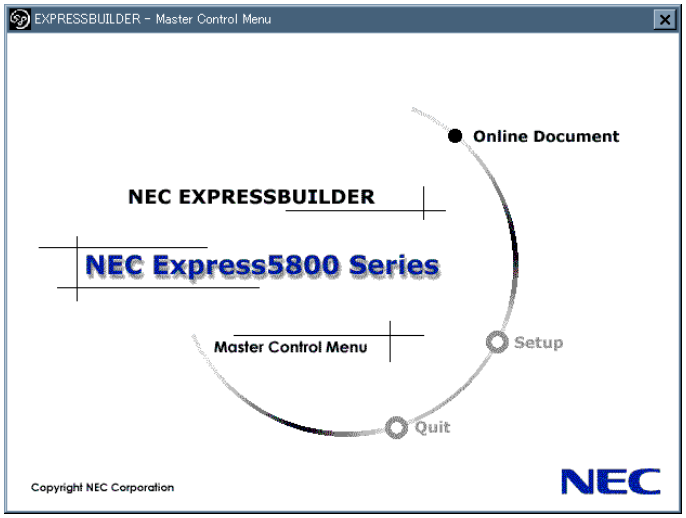
- DOS-based with remote console

  Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

NOTE: No keyboard connected to the server is permitted to run this program.

- Windows-based

  This program is called as "Master Control Menu" that can run under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later). You can install the several applications and read the documentation from the menu.



NEC EXPRESSBUILDER for DOS-Based with Local Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with local console.

Starting NEC EXPRESSBUILDER

The following procedure instructs you to start NEC EXPRESSBUILDER.

> **IMPORTANT:** Do not remove the NEC EXPRESSBUILDER CD-ROM while NEC EXPRESSBUILDER is running.

1. Turn on peripheral devices and the server in this order.
2. Insert the NEC EXPRESSBUILDER CD-ROM supplied with your server into the CD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   NEC EXPRESSBUILDER boots up displaying the top menu.

NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

Express Setup

"Express Setup" is intended for initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

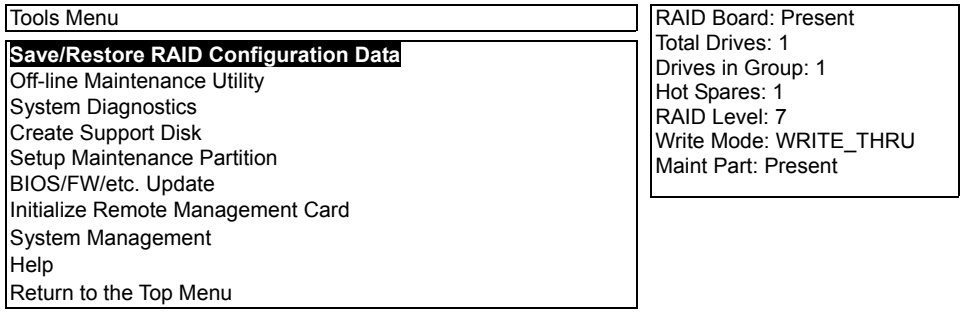
If you install Windows Server 2003 or Windows 2000, after a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and install the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

IMPORTANT:

- Express Setup does not support the installation of Windows Server 2003 x64 Editions.
- The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk drive.
- Once Express setup is started, do not remove "Configuration Diskette" from the floppy disk drive without any directions.

Tools

"Tools" is also intended for initial setup of the server. It provides more installation options than Express Setup and permits the user to quickly create utility support disks, run the Off-line Maintenance Utility and system diagnostic utility, set up a maintenance partition, and update the various BIOS programs.



- Save/Restore RAID Configuration Data

  The item allows the configuration information on the disk array system to be saved or restored from the floppy disk.

  If the HostRAID and LSI-Logic disk array controllers are used together, the configuration information of HostRAID is saved or restored. If the Adaptec Zero channel raid controller (ZCR) and LSI-Logic disk array controller are used together, the configuration information of ZCR is saved or restored.

IMPORTANT: In these cases, If you want to save or restore the configuration information of LSI-Logic disk array controller, refer to the "Power Console Plus User's Guide".

– Save Disk Array Configuration Data

The configuration information on the disk mirroring controller is saved into the floppy disk. If you set or change RAID, always use this function to save the configuration information into a floppy disk.

IMPORTANT: Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.

– Restore Disk Array Configuration Data

The configuration information saved in a floppy disk is restored to NVRAM and hard disk drive on the disk mirroring controller.

If the configuration information is broken or changed by mistake, restore the configuration information.

When the defected disk array controller is replaced, the configuration information on the hard disk drive must be saved into the disk array controller.

However, if the configuration information on the new disk mirroring controller is saved into a hard disk drive, use this function to restore the configuration information.

IMPORTANT:

- Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.
- This is a function for maintenance. Please do not use it except maintenance.

- Off-line Maintenance Utility

Off-line Maintenance Utility is an OS-independent maintenance program that performs preventive maintenance and error analysis for your server. See Chapter 8 or online help for details.

- System Diagnostics

Executes various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the System Diagnostics is executed, a system check program assigned to each model starts. See Chapter 7 for details.

- Create Support Disk

NEC EXPRESSBUILDER CD-ROM contains a number of device drivers and utilities that you can put on floppy disks and load onto your system.

Using this menu creates a support disk by copying from the NEC EXPRESSBUILDER CD-ROM. If your system has the Windows operating system, you may find it more convenient to use NEC EXPRESSBUILDER for Windows-based to make support disks

Write the displayed title on the floppy disk label, which is useful for management in the future. Customers are to provide a floppy disk to create a support disk.

- Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER

  Creates a support disk for installing Windows Server 2003 x64 Editions.

- Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

  Creates a support disk for installing Windows Server 2003 Standard Edition and Windows Server 2003 Enterprise Edition. (No need to create this disk when installing the operating system with the Express Setup.)

- Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

  Creates a support disk for installing Windows 2000 Server and Windows 2000 Advanced Server. (This disk is utilized for Windows 2000 clean installation and for Recovery for Windows 2000 system.) (No need when installing the operating system with the Express Setup.)

- ROM-DOS Startup FD

  Creates a support disk for starting the ROM-DOS system.

- Off-line Maintenance Utility Bootable FD

  Creates a support disk for activating the Off-line Maintenance Utility.

- System Management FD

  Creates a support disk for activating the System Management.

■ Setup Maintenance Partition

Maintenance partition is a specific partition for the server and created on your system disk. About 55MB of the maintenance partition includes the various maintenance utilities and executable commands.

In this menu, you can create the maintenance partition, install the various utilities, and update the utilities. The maintenance utilities installed in the maintenance partition are system diagnostics, System Management, and Off-line Maintenance Utility.

IMPORTANT:

- Do not reset or turn off the server while the running this menu. If the processing is discontinued, the system becomes unable to start.
- The existence of the maintenance partition may be identified from the operating system. In order to retain the Configuration Data, do not delete the partition.

NOTES:

- The maintenance partition, once created, will not be recreated again.
- When the maintenance partition does not exist, some menu items do not appear.

– Create Maintenance Partition

NEC EXPRESSBUILDER creates about 55MB of the maintenance partition on the system disk (or disk array system) as work area. The various utilities are installed when the maintenance partition is created successfully or when the maintenance partition is already created.

– Install Maintenance Partition Utilities

Various utilities are installed in the maintenance partition from the CD-ROM.

– Update Maintenance Partition Utilities

Various utilities are copied in the Maintenance Partition from the update disk. This menu is only used when the update disk is supplied from your service representative or attached with your system.

– FDISK

Execute FDISK command of ROM-DOS system. You can create/delete partitions, etc.

■ BIOS/FW/etc. Update

This menu allows you to update the software module such as BIOS and firmware of the server by using the update disk (3.5-inch floppy disk) that is distributed from NEC customer service representative.

After rebooting the system, an update program is started automatically from the floppy disk, and the various BIOS and firmware programs are updated.

IMPORTANT: Do not turn off the server while the update program is running. If the update processing is discontinued, the system becomes unable to start.

■ Initialize Remote Management Card

"Initialize Remote Management Card" is used to configure the Remote Management Card with correct parameters of the system installed it.

■ System Management

The parameters of BMC (Baseboard Management Controller) are set for remote control and alert.

■ Help

Displays explanations about various functions of NEC EXPRESSBUILDER.

■ Return to the Top Menu

Choosing this menu returns to the Top Menu.

NEC EXPRESSBUILDER for DOS-based with Remote Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with remote console.

NEC EXPRESSBUILDER contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

IMPORTANT:

- Do not use this feature on any other computer than the server, or on any other server obtained without the NEC EXPRESSBUILDER. Doing so may cause a failure of the server.
- When a keyboard is connected to the server, the remote console feature is disabled. The NEC EXPRESSBUILDER determines that the server has a console. (Nothing is displayed on the management PC.)
- If you fail to configure the disk array controller N8103-80F or 81F from the remote console, try again using the server console.
- The system may fail to operate with the transfer rate of 115.2 Kbps for serial console redirection. Specify any other transfer rate than 115.2 Kbps.

Starting

The following two methods are available to start the server.

- Running NEC EXPRESSBUILDER from the management PC via LAN
- Running NEC EXPRESSBUILDER from the management PC via direct connection (COM B)

For the procedure for starting NEC EXPRESSBUILDER for DOS-based with Remote Console, see "NEC DianaScope".

IMPORTANT:

- Do not change the boot device order in BOOT menu in BIOS SETUP. NEC EXPRESSBUILDER cannot be used if the CD-ROM drive is not the first device to launch the system.
- To use this feature, you need 3.5-inch floppy disk. Please prepare the floppy disk.

NOTE: The following items of BIOS setup information will be set as shown below.

- LAN Controller: [Enabled]
- Serial Port A: [Enabled]
  Base I/O Address: [3F8]
  Interrupt: [IRQ 4]
- Serial Port B: [Enabled]
  Base I/O Address: [2F8]
  Interrupt: [IRQ 3]
- BIOS Redirection Port: [Serial B]
- Baud Rate: [19.2K]
- Flow Control: [CTS/RTS]
- Console Type: [PC ANSI]

Top Menu

Shown below are the top menu items.

- Setup

  Automatically sets up the server.

- Tools

  Launch the features of NEC EXPRESSBUILDER individually.

- Help

  Help message on NEC EXPRESSBUILDER.

- Quit

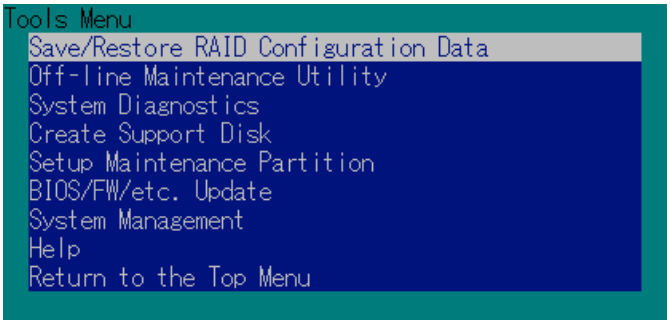
  Quit NEC EXPRESSBUILDER.

Setup

The NEC EXPRESSBUILDER checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

Tools

When you select the [Tools] on the Top Menu, the following screen appears.



The menu items available only in remote console operation among those described in section "NEC EXPRESSBUILDER for DOS-based with Local Console" are displayed. See the previous subsection for detailed explanation of menu items.

IMPORTANT: The following is varied from the [Tools] menu in the local console mode.

- Test items and operation method of System Diagnostics. See Chapter 7 for details.

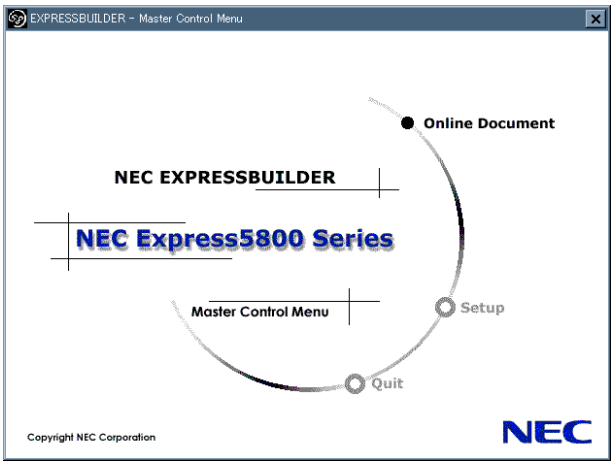
NEC EXPRESSBUILDER for Windows-Based (Master Control Menu)

The Master Control Menu is used to,

- Read the User's Guide or the other documents,
- Update the NEC Express5800 system, and
- Install the management software.

NOTES:

- Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).
- Some documents are provided in the PDF format. Use the Adobe Acrobat Reader to read these documents.



Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive. Master Control Menu appears on the screen automatically. If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some items are grayed-out when the logon user does not have the authority of the administrator or the item is not proper for the system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or
- Click the right mouse button on Master Control Menu window.

CONFIGURATION DISKETTE CREATOR

"Configuration Diskette Creator" is a tool to create [Configuration Diskette] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette Creator to operate the setup, you can setup from the installation of OS to several utilities automatically except for a few key input to confirm the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Configuration Diskette] to setup the servers from NEC EXPRESSBUILDER.

IMPORTANT: You can not create [Configuration Diskette] for Microsoft Windows Server 2003 x64 Editions.

NOTE: You can install Windows Server 2003 and Windows 2000 without [Configuration Diskette]. Also, you can modify/newly create [Configuration Diskette] during the setup with NEC EXPRESSBUILDER.

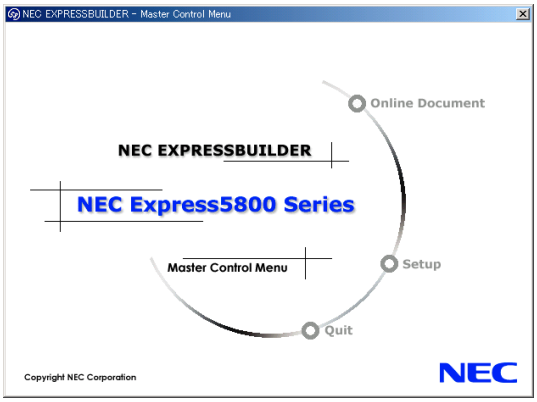
Creating Configuration Diskette

This section describes about specifying setup information that is necessary for OS installation and creating [Configuration Diskette]. Follow the procedure below.

NOTE: In the procedure below, the folder name that is specified when installing Trekking command is assumed as [Configuration Diskette Creator].

1. Start the OS.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu will appear.
3. Right-click on the screen or left-click [Setup]. The menu will appear.

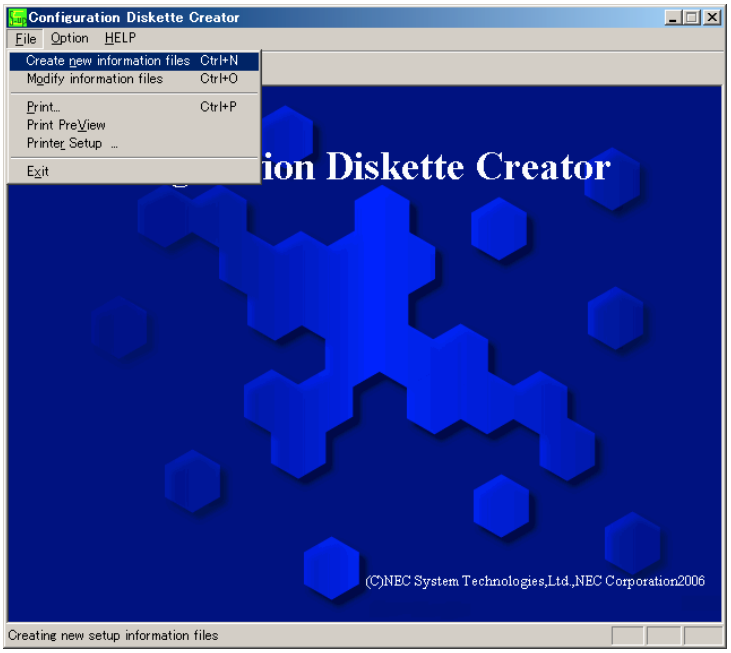


4. Click [Configuration Diskette Creator].

   Configuration Diskette Creator window is displayed.

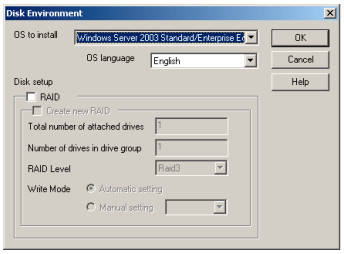
5. Click [Create New Information files] from the [File] menu.

   The [Disk Environment] dialog box will be displayed.



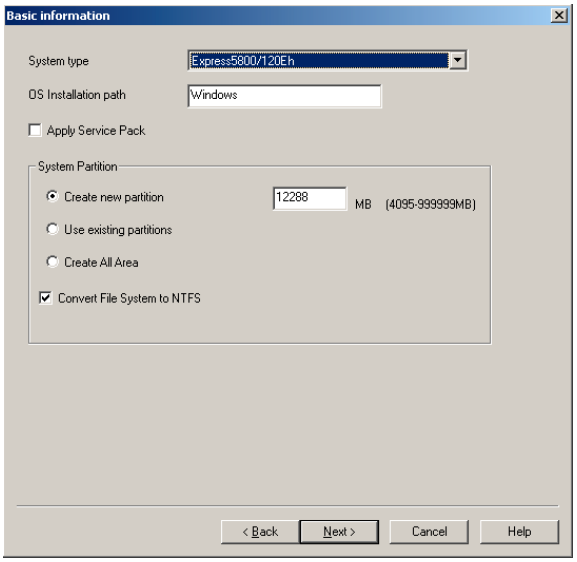
6. Specify each item and click on [OK].

   The dialog boxes to specify setup information will be displayed in order, such as [Disk Environment] dialog box.



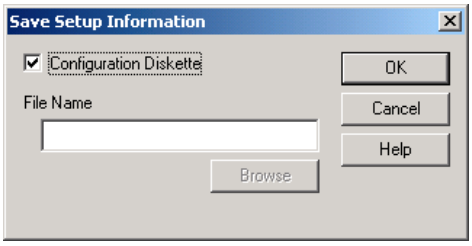
7. Follow the message to specify each item on the dialog box and click [Next].

NOTE: If you click on [Cancel], all the input value will be deleted.



When completing the specification of setup information, the [Save Setup Information] dialog box will appear.

8. Confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].



9. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

Now [Configuration Diskette] has been created. [Configuration Diskette] is used when you install Windows Server 2003 or Windows 2000. Put a label and keep it where it will not be lost.

NOTE: For the information on the contents of each specifying item, refer to the Help.

If you want to modify the information file that already exists, click [Modify information files] on Configuration Diskette Creator window. Refer to the Help to modify the inf file.

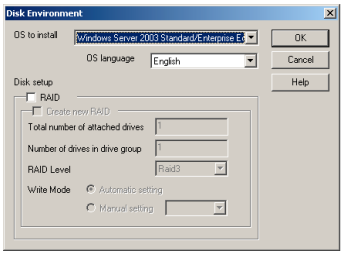
Installing Optional Mass Storage Driver

To install optional Mass Storage Driver that is supported by the Express Setup, follow the procedure below to create [Configuration Diskette].

1. Display Configuration Diskette Creator window.
2. From the [File] menu, click [Create new information files].

   [Disk Environment] dialog box will be displayed.
3. Specify each item and click on [OK].

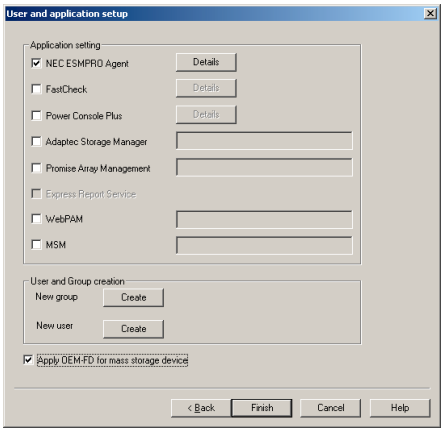
   The dialog boxes to specify setup information will be displayed in order, such as [Disk Environment] dialog box.



4. Follow the message to specify each item on the dialog box and click on [Next].

   NOTE: If you click on [Cancel], all the input value will be deleted.

5. When [User and application setup] is displayed, check [Apply OEM-FD for mass storage device].



6. When the [Save Setup Information] dialog box is displayed, confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].
7. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click on [OK].

NEC ESMPRO

The NEC ESMPRO (referred to as ESMPRO hereafter) lets a system administrator manage remote servers across a network. ESMPRO monitors server hardware and software configurations, failures, and performance. With log data collected by ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

Functions and Features

The ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, and LAN boards.
  - Software resources, such as operating system information and drivers running on each server.
- Server failures
  - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
  - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
  - ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online document in the NEC EXPRESSBUILDER CD-ROM.

Adaptec Storage Manager™ - Browser Edition

Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) is a Web-based application that locally or remotely manages Zero Channel RAID (hereinafter abbreviated to ZCR) and HostRAID storage system provided by Adaptec Inc.

> **IMPORTANT:** Be sure to use ASMBE on the system other than Windows Server 2003 x64 Edition. To monitor and manage HostRAID on Windows Server 2003 x64 Edition, use Adaptec Storage Manager™ (hereinafter abbreviated to ASM).

Features

- Maintaining ZCR and HostRAID storage system
- Making a consistency check on redundant disk arrays
- Recording ZCR and HostRAID events into the event log
- Omitting the installation of client software into each management PC if the previously mentioned browser is installed. This is because ASMBE uses the browser (Internet Explorer 5.5 or later).

Before attempting to operate ASMBE, read the "Adaptec Storage Manager™ - Browser Edition User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the ASMBE installation procedure and notes on operating ASMBE.

Adaptec Storage Manager™

Adaptec Storage Manager™ (hereinafter abbreviated to ASM) is an application that locally or remotely manages HostRAID storage system and provides RAID functions through the SCSI interface on the Windows Server 2003 x64 Edition in your server. You can use the following functions for HostRAID by installing ASM in your system.

Features

- Creating disks at a level of RAID0, RAID1, or RAID10
- Creating Hot Spare disks that are to be used for automatically executing Rebuild if a redundant disk array enters the Degraded state
- Making a consistency check on redundant disk arrays
- Recording HostRAID events into the event log

Before attempting to operate ASM, read the "Adaptec Storage Manager™ User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the ASM installation procedure and notes on operating ASM.

IMPORTANT: You cannot install ASM with EXPRESS Setup. Install ASM manually.

Power Console Plus

Power Console Plus is a utility to control the RAID system of the disk array controller (MegaRAID controller) produced by LSI Logic. Use of Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local NEC Express servers and NEC Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

Major Functions

Power Console Plus has the following features:

- Supporting the Wizard function to facilitate configuration
- Enabling the change of RAID levels
- Being compatible with SAF-TE
- Supporting the performance monitor
- Supporting enclosure functions such as temperature monitoring, power monitoring, and fan monitoring
- Enabling the settings of Write, Read, and Cache policies for each logical drive
- Supporting the save and restore functions for configuration
- Enabling the display of the SCSI transfer rate

Components

Power Console Plus consists of the following five components:

- SNMP Agent

  This function is not yet supported. Do not install SNMP Agent.

- MegaRAID Service Monitor

  Enables NEC ESMPRO to monitor the MegaRAID controller by registering event logs. Install MegaRAID Service Monitor in the NEC Express server in which the MegaRAID controller is mounted.

- MegaRAID Client

  Controls the RAID system on graphical screens. Install MegaRAID Client in the NEC Express server in which the MegaRAID controller mounted or in the management PC that is connected through the NEC Express server and network.

- MegaRAID Server

  Enables control of the MegaRAID controller via the network. Install MegaRAID Server in the NEC Express server in which the MegaRAID controller mounted.

- MegaRAID Registration Server

  Enables control of the MegaRAID controller via the network. Install in one of NEC Express servers and management PCs that are connected through network. The above components must be installed correctly for establishing the environment to use Power Console Plus.

Power Console Plus components to be installed are different between the target servers and management PC.

- Server:
  NEC Express server in which the MegaRAID controller is mounted

  Install the following three components in this server:

  – MegaRAID Service Monitor

  – MegaRAID Server

  – MegaRAID Client

- Management PC:
  Management PC that monitors and controls servers via the network (TCP/IP)

  When managing array on Terminal Server working on Windows NT Server Version 4.0 Terminal Server Edition, prepare PC, and install Management PC component. Management PC does not guarantee operation on Client, which used Terminal Server, Terminal Server Emulator, WBT.

  Start Power Console Plus of management PC, after the Power On machine that installed "Server" and "Management Server".

  Install the following component in this PC:

  – MegaRAID Client

- Management server:
  Machine that manages all servers that are monitored and controlled by management PCs

  Install the following component in one of the servers or management PCs:

  – MegaRAID Registration Server

Server Setup

This section explains Power Console Plus setup in the NEC Express server in which the MegaRAID controller is mounted.

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a server.

- Hardware
  - Machine:

    NEC Express5800 series connected with the AMI disk array controller (A)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk drive:

    5MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

    Pointing device such as a mouse
- Software
  - Microsoft Windows NT version 4.0

    (Windows NT Version 4.0 Service Pack 5 or later + Internet Explorer 4.01 Service Pack 2 or later)
  - Microsoft Windows 2000
  - Microsoft Windows Server 2003

Management PC Setup

This section explains Power Console Plus setup in a computer that manages servers via the network (TCP/IP).

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a management PC.

- Hardware
  - Machine:

    NEC Express5800 series

    PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk drive:

    5 MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

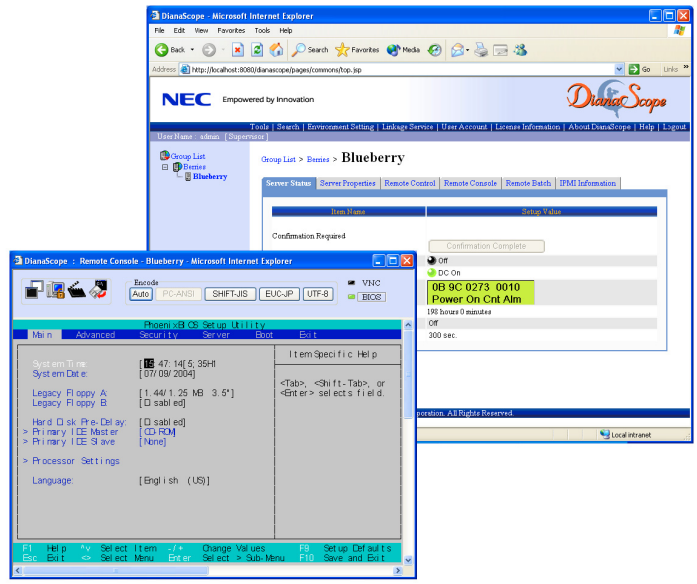
    Pointing device such as a mouse
- Software
  - Microsoft Windows NT Version 4.0

    (Windows NT Version 4.0 Service Pack 5 or later + Internet Explorer 4.01 Service Pack 2 or later)
  - Microsoft Windows 2000
  - Microsoft Windows 95/98/Me
  - Microsoft Windows Server 2003

NEC DianaScope

NEC DianaScope is software for the remote management of the NEC Express5800 series.

See the online documents for details on the functions and installation of NEC DianaScope.



NOTE: You need the server license to activate DianaScope for this product.
The server license below is attached to this product.

- DianaScope Additional Server License (1)

Notes

The online documents explain general information about servers to be managed by NEC DianaScope. This section explains specific notes on managing this product remotely from NEC DianaScope.

- This product can be managed remotely from NEC DianaScope only when it is equipped with a remote management card or advanced remote management card.
- This product does not support the remote FD function.

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Chapter 7

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disk drives of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your service representative.

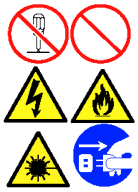
When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration. When your hard disk drives have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

CLEANING

Clean the server on a regular basis to keep the server in a good shape.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not look into the CD-ROM drive.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.
- Protect the unused connectors with the protective cap.

Cleaning the Server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

1. Make sure that the server is off-powered (the POWER/SLEEP LED goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the mother board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

⚠ WARNING

Unplug all power cords.

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

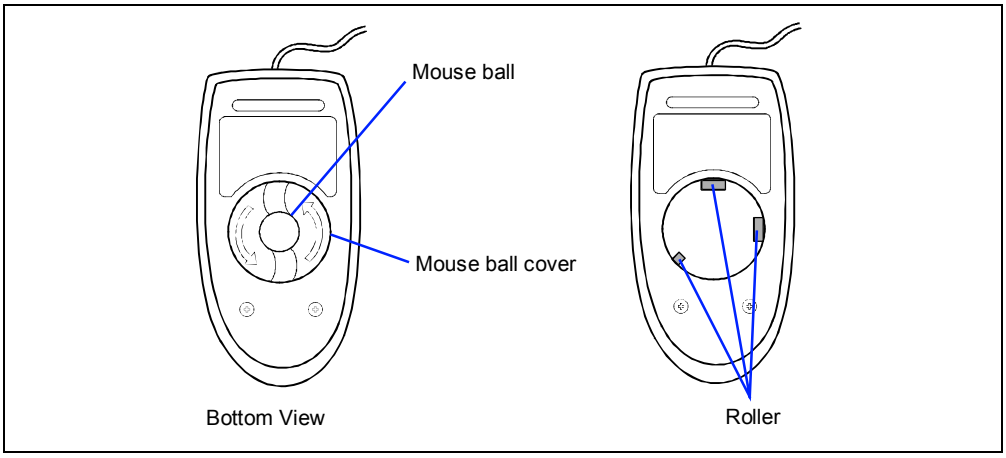
1. Turn off the server and unplug all power cables.
2. Remove the logic cover and drive cover. (See Chapter 9.)
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the mother board.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the left side cover. (See Chapter 9.)
7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER/SLEEP LED goes off), and then wipe the keyboard surface with a dry cloth.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Make sure that the server is off-powered (the POWER/SLEEP LED goes off).
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.



5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning CD-ROM

A dusty CD-ROM or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and CD-ROM regularly:

1. Make sure that the server is powered (the POWER/SLEEP LED is lit).
2. Press the CD tray Open/Close button on the front of the CD-ROM drive. The tray opens.
3. Hold the CD-ROM lightly and take it out from the tray.

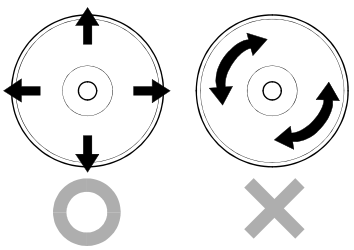
> **NOTE:** Do not touch the signal side of the CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

> **IMPORTANT:** Do not wipe the lens of the CD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Push on the tray front to close the tray.
6. Wipe the signal side of the CD-ROM with a dry soft cloth.

> **IMPORTANT:** Wipe CD-ROMs from the center to the outside. Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM with record spray/cleaner, benzene, or thinner causes damage to the CD-ROM contents. At worst, inserting the CD-ROM into the server may cause failure.



SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the NEC EXPRESSBUILDER provided with the server to diagnose the server.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk drive used as a system

IMPORTANT: When executing the System Diagnostics, make sure to remove the LAN cable. Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

NOTE: On checking the hard disk drive, no data is written into the disk.

Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

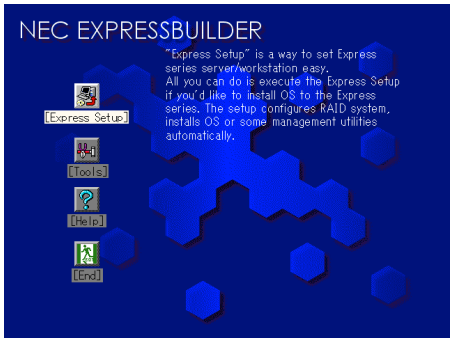
> **IMPORTANT:** Two methods of LAN and the serial port are mentioned in Chapter 6 "NEC EXPRESSBUILDER" in the way of communicating in remote console. Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

Procedures to start the diagnostics program is as follows:

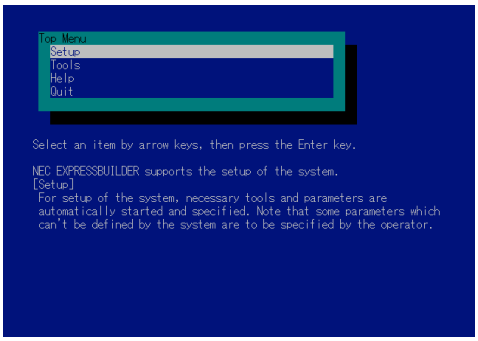
1. Shutdown the OS, and turn off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Use the NEC EXPRESSBUILDER CD-ROM to reboot the server.

   See the Chapter 6 "NEC EXPRESSBUILDER" for details.

   The following menu appears when started the server using the NEC EXPRESSBUILDER.


NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

Local console


Top Menu
Setup
Tools
Help
Quit
Select an item by arrow keys, then press the Enter key.
NEC EXPRESSBUILDER supports the setup of the system.
[Setup]
For setup of the system, necessary tools and parameters are automatically started and specified. Note that some parameters which can't be defined by the system are to be specified by the operator.

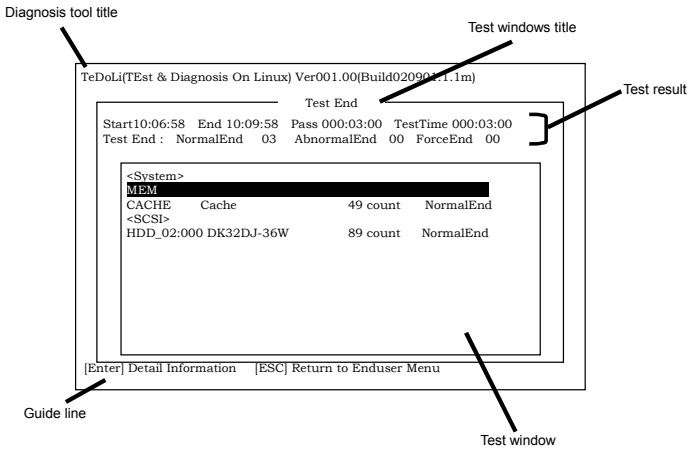
Remote console

5. Select [Tools].

6. Select [System Diagnostics].

The System Diagnostics starts and completes in approximately three minutes.

When the diagnosis completes, the screen of the display changes in the following indication.


Diagnosis tool title
Test windows title
TeDoLi(TEst & Diagnosis On Linux) Ver001.00(Build020903:1.1m)
Test End
Test result
Start10:06:58 End 10:09:58 Pass 000:03:00 TestTime 000:03:00
Test End : NormalEnd 03 AbnormalEnd 00 ForceEnd 00
<System>
MEM
CACHE Cache 49 count NormalEnd
<SCSI>
HDD_02:000 DK32DJ-36W 89 count NormalEnd
[Enter] Detail Information [ESC] Return to Enduser Menu
Guide line
Test window

Diagnosis tool title: shows a name of this diagnosis and Version information.

Test windows title: shows the progress of diagnosis. When it completes, it shows "Test End"

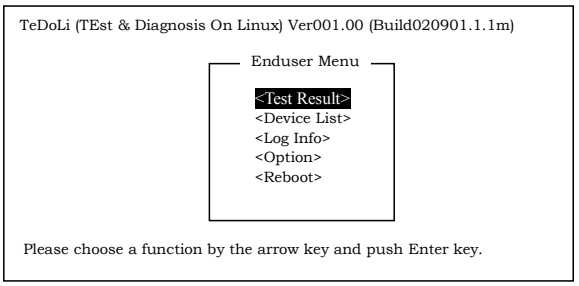
Test Result: shows the information including time of start, end and progress, and result of the diagnosis.

Guide line: shows a description of keys to navigate the window.

Test window: Move the cursor and press **Enter** to view the detail of the diagnosis.

If an error is detected during the System Diagnostics, the test result shows "Abnormal End" in red color. Move the cursor and press **Enter** on the diagnosis which error occurred. Take a note of the error message showed, and contact your service representative.

7. Follow the Guide line showed in the bottom of the screen and press ESC to show the End user Menu showed below.



<Test Result> shows the screen of the diagnosis completed aforementioned.

<Device List> shows the information of all the devices connected.

<Log Info> shows the log information and error messages of the diagnosis. It can be saved to a floppy disk. To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save(F)>.

<Option> change where to output log.

<Reboot> Restarts the Express Server.

8. Select <Reboot> in the End user Menu above.

   The Express Server restarts, and NEC EXPRESSBUILDER boot the system.

9. Exit the NEC EXPRESSBUILDER, and remove the CD-ROM from the CD-ROM drive.
10. Turn off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables to the server.
12. Plug the power code.

This completes the System Diagnostics.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

IMPORTANT:

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the service representative.
- Make sure to make a backup copy of your valuable data in the hard disk drive, if any.
- Make sure not to apply a shock to hard disk drives to relocated the server if the contains any.

1. Take a floppy disk and a CD-ROM out of the server, if any.
2. Power off the server (the POWER/SLEEP LED goes off).
3. Unplug the power cord of the server from a power outlet.
4. Remove all the cables from the server.
5. Hold the server by its bottom with at least three persons to carry the server.

IMPORTANT: Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

6. Protect the server with the shock-absorbing materials, and pack it securely.

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Chapter 8

Troubleshooting

If your server does not operate as expected, read this chapter before assuming a failure.

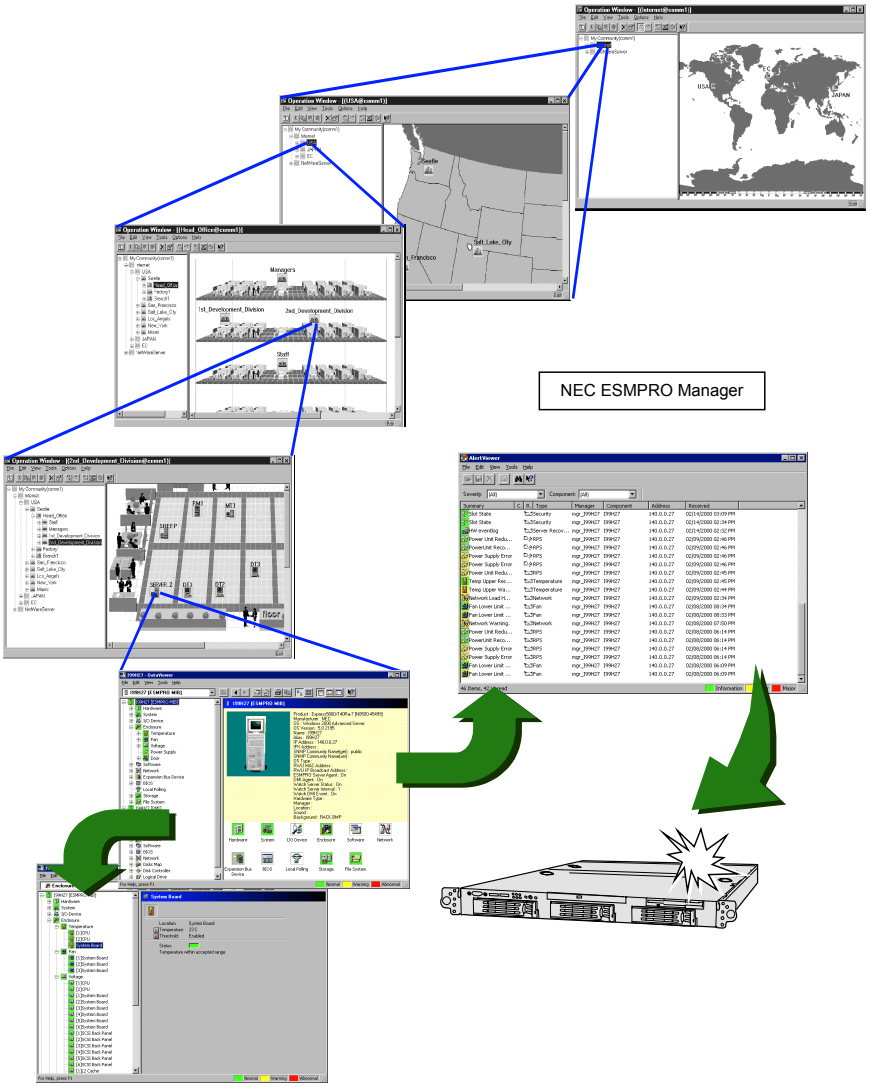
> **NOTE:** For provision against an unexpected failure, it is recommended to install the maintenance utility, NEC ESMPRO, to the server and client computers.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

Especially take note on whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, Data Viewer, or Alert Viewer of NEC ESMPRO Manager.

[Example]



LEDS

The server includes LEDs to indicate the server states by a variety of colors and display patterns on the front panel, hard disk drive, and power supply.

Chapter 2 "Status Indicators" lists the LED displays and their meanings and the actions taken at occurrences of failures.

ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility appears on the screen following the server reboot.

IMPORTANT: Take a note on the on-screen message before contacting your service representative. The alarm indication would be a great help for maintenance.

POST Error Messages

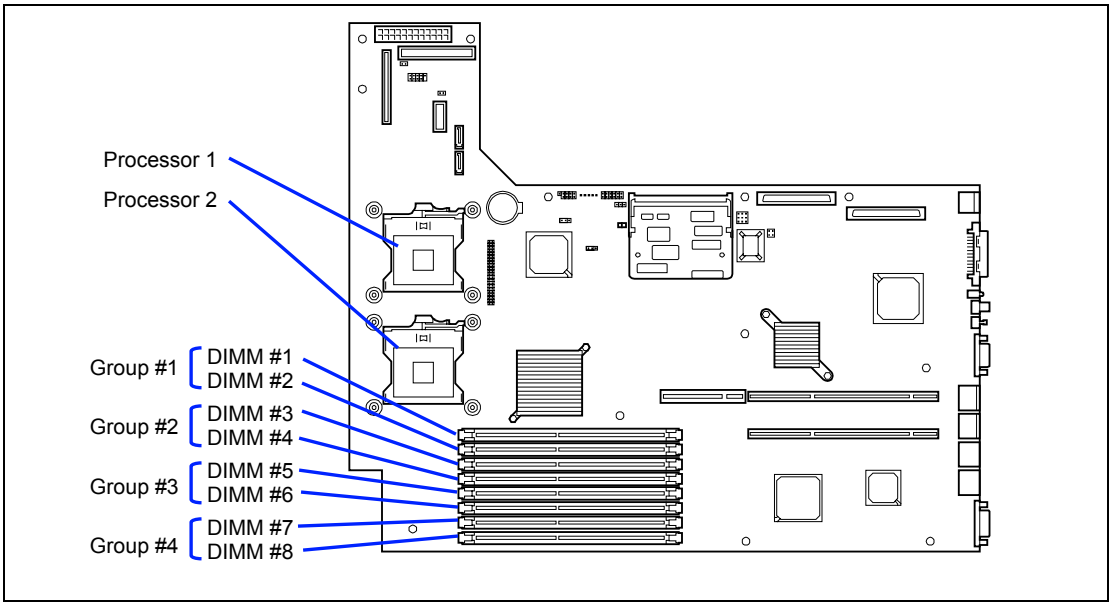
When POST detects an error, it displays an error message on the display unit screen. The following table lists error messages and actions to take.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Error code	Error message	Recommended Action
0200	Failure Fixed Disk.	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	
02B0	Diskette drive A error.	Start the SETUP to set the "Legacy Floppy A" in the Main menu again. If the same error occurs successively in spite of the resetting, contact your service representative.
02B2	Incorrect Drive A type - run SETUP.	Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.

Error code	Error message	Recommended Action
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not write able.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B30	FAN1 Alarm occurred.	Contact your service representative to replace the fan.
0B31	FAN2 Alarm occurred.	
0B32	FAN3 Alarm occurred.	
0B33	FAN4 Alarm occurred.	
0B34	FAN5 Alarm occurred.	
0B35	FAN6 Alarm occurred.	
0B36	FAN7 Alarm occurred.	
0B37	FAN8 Alarm occurred.	
0B38	FAN9 Alarm occurred.	
0B39	FAN10 Alarm occurred.	
0B5F	Forced to use Processor with error	Because an error is detected in every CPU, the system is forcibly started. Contact your service representative.
0B60	DIMM group #1 has been disabled	Contact your service representative.
0B61	DIMM group #2 has been disabled	
0B62	DIMM group #3 has been disabled	
0B70	The error occurred during temperature sensor reading.	Contact your service representative.
0B71	System Temperature out of the range.	Contact your service representative to replace the fan.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8B	BMC progress check timeout.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	

Error code	Error message	Recommended Action
0B8F	Could not redirect the console - BMC Parameter Error -	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	
0B92	Internal Use Area of BMC FRU corrupted.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	Management controller not responding.	Update the RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	Contact your service representative.
0BB1	SMBIOS – SROM data checksum bad.	
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the relevant group.
8101	Memory Error detected in DIMM group #2.	
8102	Memory Error detected in DIMM group #3.	
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot n (n: slot number)	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 4).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Update BMC firmware according to "BMC Online Update" in Chapter 6 by using the NEC EXPRESSBUILDER.


Processor 1
Processor 2
Group #1
DIMM #1
DIMM #2
Group #2
DIMM #3
DIMM #4
Group #3
DIMM #5
DIMM #6
Group #4
DIMM #7
DIMM #8

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-5-2-2 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that no processor is detected on the mother board.

Beep code	Description	Recommended action
1-2	Option ROM initialization error	1. Check if the optional add-in card is properly installed. 2. Run the BIOS SETUP utility to check the IRQ assignment. 3. Ask your service representative to replace the add-in card or mother board..
3-3	ROM checksum error	Replace the mother board.
1-2-2-3		
1-3-1-1	DRAM refresh test error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-1-3	Keyboard controller error	1. Check if the keyboard is properly connected. 2. Replace the mother board.
1-3-3-1	No memory or capacity check error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board..
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1	CPU startup error	1. Check if the CPU is properly installed. 2. Remove the CPU once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed CPU.
1-5-2-1	No CPU installed	
1-5-4-4	Abnormal voltage	
2-1-2-3	BIOS ROM copyright test error	Replace the mother board.
2-2-3-1	Unexpected interrupt test error	

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your service representative.

Problems with the Server

Fail to power on the server:

- ❑ Is the server is properly supplied with power?
  - → Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
  - → Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.
  - → Make sure the power breaker for the connected power outlet is on.
  - → If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.

    Power supply to the server may be linked with the connected UPS using the BIOS SETUP utility of the server.

    <Menu to check: [Server] - [AC-LINK]>
- ❑ Did you press the POWER switch?
  - → Press the POWER switch on the front of the server to turn on the power (the POWER LED lights).

Fail to power off the server:

- ❑ Is the POWER switch enabled?
  - → Restart the server and start the BIOS SETUP utility.

    <Menu to check: [Security] - [Power Switch Inhibit]>
- ❑ Is the server running in the Secure Mode?
  - → The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

No screen display appears with beep:

→ Check whether DIMMs are connected to the mating connectors firmly.

→ Check whether DIMMs of different specifications are installed in the specific group. See Chapter 9 for the specifications of DIMMs.

→ DIMMs must be populated in pairs and in the following order:
#5 and #6, #3 and #4, then #1 and #2.

→ Installed DIMMs must be the same speed and must all be registered.

→ Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

POST fails to complete:

❑ Is the DIMM board installed?

→ At least two DIMM boards are required for operation.

→ Installed DIMMs must be the same speed and must all be registered.

→ DIMMs must be populated in pairs and in the following order:
#5 and #6, #3 and #4, then #1 and #2.

❑ Is the memory size large?

→ The memory check may take a few seconds if the memory size is large. Wait for a while.

❑ Did you perform any keyboard or mouse operation immediately after you started the server?

→ If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

❑ Does the server have contains appropriate memory boards or PCI devices?

→ Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?

  → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

- ❑ Is the power-on order correct?

  → When the server has any external devices connected, power on the external devices first, then the server.

- ❑ Did you install drivers for connected optional devices?

  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- ❑ Is BIOS configuration correct?

  → When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM]
  x: PCI slot number>

  → Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menu to check: [Advanced] - [Peripheral Configuration]>

The POWER switch and sleep feature are disabled:

- ❑ Is the server in the Secure Mode?

  → In the Secure Mode, the POWER switch and sleep feature are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

The keyboard or mouse fails to operate:

- ❑ Is the cable properly connected?

  → You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the provided cable is connected to the correct connector on the rear of the server.

  → The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.

- ❑ Is BIOS configuration correct?

  → The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.

  <Menus to check: [Advanced] - [Numlock]>

- ❑ Are the server drivers installed?

  → Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

- ❑ Is the server in the Secure Mode?

  → In the Secure Mode, the keyboard and mouse are disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access (read or write) to the floppy disk:

- ❑ Does the floppy disk drive contain a floppy disk?

  → Insert a floppy disk into the floppy disk drive until it clicks.

- ❑ Is the floppy disk write-protected?

  → Place the write-protect switch on the floppy disk to the "Write-enabled" position.

- ❑ Is the floppy disk formatted?

  → Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

- ❑ Is BIOS configuration correct?

  → The floppy disk drive may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

  <Menus to check:
  [Main] - [Floppy A]
  [Security] - [Diskette Write Protect]

- ❑ Is the server in the Secure Mode?

  → In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access to the CD-ROM:

- ❑ Is the CD-ROM properly set in the CD-ROM drive tray?

  → The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.

- ❑ Is the CD-ROM applicable to the server?

  → The CD-ROM for Macintosh is not available for use.

Inserted the correct CD-ROM but the message like the following is displayed:

```
The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK
```

- ❑ Is the data side of the CD-ROM dirty or injured?

  → Take the CD-ROM out of the CD-ROM drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk drive:
(Refer to the documentation supplied with the disk array controller.)

- ❑ Is the hard disk drive applicable to the server?

  → Operation of any device that is not authorized by NEC is not guaranteed.

- ❑ Is the hard disk drive properly installed?

  → Make sure to lock the hard disk drive with the lever on its handle. The hard disk drive is not connected to the internal connector when it is not completely installed (see Chapter 9).

Fail to access the external SCSI devices:

- ❑ Is the SCSI device applicable to the server?

  → Operation of any SCSI device that is not authorized by NEC is not guaranteed.

- ❑ Are SCSI devices properly configured?

  → When the server has external SCSI devices connected, hard disk drive settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.

- ❑ Are the SCSI controllers (including optional controllers) properly configured?

  → Use the BIOS SETUP utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS SETUP utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Cannot install the operating system correctly.

- ❑ Did you confirm the notes on installing the operating system?

  → See Chapter 6.

Fail to start the OS:

- ❑ Is a floppy disk in the floppy disk drive?

  → Take out the floppy disk and restart the server.

- ❑ Is the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive?

  → Take out the NEC EXPRESSBUILDER CD-ROM and restart the server.

- ❑ Is the OS broken?

  → Use recovery process to recover the system. (See "Recovery for Windows 2000 System" in this Chapter.)

The server is not found on the network:

- ❑ Is the LAN cable connected?

  → Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms with the network interface standard.

- ❑ Is BIOS configuration correct?

  → The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

  <Menus to check:

  [Advanced] - [PCI Configuration] - [Onboard NIC] - [Embedded NIC (Dual Gbit)]>

- ❑ Have the protocol and service already configured?

  → Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- ❑ Is the transfer speed correct?

  → Open the network property dialog box in control panel to specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Wake on LAN does not start from standby state.

- ❑ Is Hub set to Auto-Negotiation? Or, Is the client set to Auto-Negotiation/optimum speed?

  → For both hub and client, Wake on LAN does not start from the standby state if the speed is fixed to 1000Mbps.

Problems with Windows Server 2003 x64 Editions

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions.

Source: DCOM

Category Error

Event ID 10016

Description: The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NT AUTHORITY\LOCAL SERVICE} SID {S-1-5-19}.

This security permission can be modified using the component Services administrative tool.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions.

Event Source: Service Control Manager

Event Type: Error

Event ID: 7011

Description: Timeout (30000 milliseconds) waiting for a transaction response from the IMAP4Svc service.

→ When this event is not registered by rebooting the system, it is not a problem in operating the system.

Problems with Windows Server 2003 R2

There are some cases that an event log is registered as follows when you operate Windows Server 2003 R2.

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver. If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

→ If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered.

For more details, refer to "Enabling the Hardware Management Feature bundled in Windows Server 2003 R2" on the following site.

[NEC Express5800 Web Site]

http://www.nec.co.jp/express/download/W2K3_R2

Problems with Windows Server 2003 and Windows 2000

During Windows 2000 installation, the following warning is registered in the System Log of the Event Viewer:

```
Error detected on the device \Device\CdRom0
during the paging operation.
```

→ There is no problem on this issue.

Fail to start the OS:

- ❑ Is a floppy disk in the floppy disk drive?

  → Take out the floppy disk and restart the server.

- ❑ Is the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive?

  → Take out the NEC EXPRESSBUILDER CD-ROM and restart the server.

- ❑ Is the OS broken?

  → Use recovery process to recover the system. (See "Recovery for Windows 2000 System" in this Chapter.)

The event log after every logon to Windows 2000 includes the following error log:

```
Description (D)
The CPUs in this multiprocessor system are not all the same revision level.
To use all processors the operating system restricts itself to the features of
the least capable processor in the system. Should problems occur with
this system, contact the CPU manufacture to see if this mix of processors
is supported.
```

- ❑ Has the CPU been expanded?

  → If the different revision (stepping) of the processor is installed in the multiprocessor system, Windows 2000 logs the above information every startup. If this message is logged, it is no problem for operation.

The OS presents unstable operation:

- ❑ Did you update the system?

  → Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER CD-ROM to update the system. (See Chapter 6.)

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting.

→ When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting.

→ There is no problem about this issue.
Check the System Event Log to confirm that STOP error occurred.

Cannot turn the power OFF at the blue screen:

→ If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The event log after every logon to Windows 2000 includes the following error log:

Description (D) The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacture to see if this mix of processors is supported.

❑ Has the CPU been expanded?

→ If the different revision (stepping) of the processor is installed in the multiprocessor system, Windows 2000 logs the above information every startup. If this message is logged, it is no problem for operation.

The OS presents unstable operation:

❑ Did you update the system?

→ Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER CD-ROM to update the system. (See Chapter 6.)

When any trouble occurred, the system does not run according to the specification of "Restart automatically":

→ When any trouble occurred on Windows 2000, the system may not restart automatically even if "Restart automatically" is specified. In such case, restart the system manually.

Cannot turn the power OFF at the blue screen:

→ If you want to turn off the power at the blue screen, execute forced power off (forced shut down: continue to press POWER switch for 4 seconds). The power will not be turned off if you press the switch just one time.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER CD-ROM, check the following:

- ❑ Did you set the NEC EXPRESSBUILDER during POST and restart the server?

  → If you do not set the NEC EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.

- ❑ Is BIOS configuration correct?

  → The boot device order may be specified with the BIOS SETUP utility of the server. Use the BIOS SETUP utility to change the boot device order to boot the system from the CD-ROM drive first.

  <Menu to check: [Boot]>

- ❑ Is an error message appeared?

  → When an error occurs while the NEC EXPRESSBUILDER is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause and Remedy
This machine is not supported.	This NEC EXPRESSBUILDER version is not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
NvRAM access error	An access to the nonvolatile memory (NvRAM) is not acceptable.
Hard disk access error	The hard disk drive is not connected or it is failed. Check whether the hard disk drive is correctly connected.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	The system-specific information can't be acquired in the mother board exchange and so on.

Problems with Express Setup

Express Setup can not be used

→ Express Setup do not support the installation of Microsoft Windows Server 2003 x64 Editions.
If you want to perform re-setup, see Appendix D and perform "Manual Setup".

Following message appeared when you tried to install Express Setup to the hard disk drive that has smaller capacity than the specified partition size:

```
The specified partition size has exceeded the capacity of the hard disk.
The setup created the partition at the maximum size that can be reserved on the hard disk.
Setup will continue the process.
OK
```

→ It is not an abnormal condition. Press **Enter** to continue the installation.

The message can not be displayed correctly when copying the files from CD-ROM or checking CD-ROM:

→ Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the CD-ROM drive.

Express Setup terminated and asks to input setup information.

→ There are some errors on the specified setup information.
Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press **Enter** again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

→ If you click [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

<The Default Value>

The specification of network protocol

Protocol :	TCP/IP[DHCP Specified]
Service :	Select sharing Microsoft network files and printer.
Client :	Microsoft network client.
Component :	SNMP, IIS (Excluding Windows Server 2003)
Application :	NEC ESMPRO Agent
	Power Console Plus
	(if optional RAID controller is installed in the system)
	Adaptec Storage Manager (When using HostRAID)

The following error log is included in the event log while operating the system:

Event ID: 16
Source: iANSMiniport
Type: Error
Category: None
Description: Team #0:The last adapter has lost link.
Network connection has been lost.

→ Though the above error is included in the event log when specifying the teaming, the LAN driver can work properly.

[Complete] does not appear on [Role of Computer] screen.

→ The [Complete] does not appear if the Setup File that has already been created is loaded.

→ [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.

→ Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install Windows 2000.

Specified to join the Domain, but the system is installed as Workgroup.

→ When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 4095MB.

→ Is the [Partition Size] specified by the value larger than the real area? If you want to create one partition in all area of the hard disk drive (excluding the maintenance area) to install the OS, specify [All Area].

→ <For Windows 2000>
Are you specifying over 200GB for the partition size?
Be sure to specify less than 200GB for the partition size.

Windows 2000 started with different display resolution from the specified value.

→ If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

→ Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

Unable to specify the details of Network adapter.

→ In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with Network adapter that has not been specified during Express Setup

→ Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000. Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

→ It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

→ When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)

→ Are you specifying more than two protocols?
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
Re-specify the details from Control Panel after starting the OS.

The following message appears on the screen and the setup is suspended while the Express Setup is executing:

```
Bad Command or filename
Insufficient disk space
```

→ Follow the procedure described below and check the BIOS settings for the SCSI controller.
As for the procedure on the SCSI controller which is not described in this User's Guide, refer to the manual accompanied with the controller and check the setting for "Int13 Extensions".

<In case the SCSI Controller is AIC-7892>

1. Press **Ctrl** + **A** when POST displays "AIC-7892".
2. Select "Configure/View Host Adapter Settings".
3. Select "Advanced Configuration Options" and press **Enter**.
4. Change the setting of "BIOS Support for Int13 Extensions" to "Enabled".
5. Exit from BIOS setup menu and restart the system.
6. Start the Express Setup.

Setup is interrupted at "Creating a working partition" process during the Express Setup.

❑ Did you connect the hard disk drive that OS is not going to be installed?

→ Disconnect the hard disk drive that OS is not going to be installed, and perform the Express Setup.

Problems with Master Control Menu

The master control menu fails to appear:

❑ Is your system Windows NT 4.0 or later, or Windows 95 or later?

→ The CD-ROM Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the CD-ROM.

❑ Is **Shift** pressed?

→ Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.

❑ Is the system in the proper state?

→ The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Problems with Configuration Diskette Creator

The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information. (When the Trekking command is used)

→ If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.

The Point to Point tunneling protocol cannot be set.

→ The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.

The details of a network adapter cannot be set.

→ Configuration Diskette Creator is unable to set the details of network adapters. Start Windows 2000/Windows Server 2003, and set the details through Control Panel.

More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.

→ Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

Problem with Disk Array

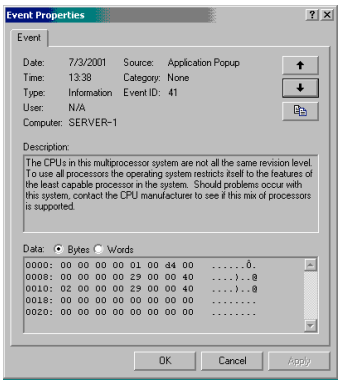
Refer to the manual that comes with the disk array controller for any trouble occurred on disk array in this system.

COLLECTING EVENT LOG

This section describes on how to collect the log of various events that occurred on the server.

IMPORTANT: If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

NOTE: The different revision processor may be mixed in additional CPU kit. When Windows 2000 is used, following message may be appeared in the System Log of the Event Viewer after extension the different revision of two or more CPUs in the NEC Express server. If this message is logged, it is no problem for operation.


Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 d4 00 ......Ô.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

1. Click [Management Tool] → [Event Viewer] from the Control Panel.
2. Select the type of the log to collect.

   On [Application Log], the events related to the running application is archived. On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows 2000 system is archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows 2000 Online Help.

COLLECTING CONFIGURATION INFORMATION

This section describes on how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

<For Windows Server 2003>

Refer to Windows online help.

<For Windows 2000>

1. Point to [Settings] in Start menu, and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Management Tool], and double-click [Computer Management].

   The [Computer Management] dialog box appears.

3. Click [System Tool] → [System Information].
4. Click [Save as System Information File] in the [Operation] menu.
5. Input the file name to save in the [File Name] box.
6. Click [Save].

COLLECTING DR. WATSON DIAGNOSTIC INFORMATION

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like. For more information, refer to Chapter 5.

MEMORY DUMP

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like.. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail)".

IMPORTANT:

- Consult with your service representative before dumping the memory. Dumping the memory while the server is in the successful operation may affect the system operation.
- Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.

Preparing for Memory Dumping

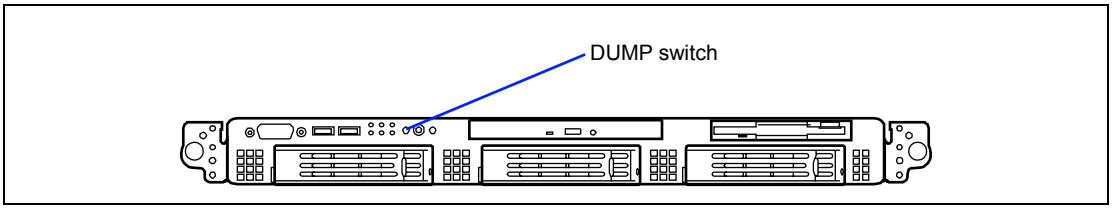
Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.
2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

IMPORTANT: Do not use a toothpick or plastic stick that is easy to break.

RECOVERY FOR Windows 2000 SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

IMPORTANT:

- After recovering the system, see "Updating the System" in Chapter 5 and be sure to update the system.
  Also on Windows 2000, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Chapter 5.
- If the hard disk drive can not be recognized, you can not recover the system.

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the system power.
2. Insert the Windows 2000 CD-ROM into the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk drive, this step is unnecessary.

   The Windows 2000 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. Press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.

5. When the following message is displayed, press **S**.

```
Setup could not determine the type of one or more mass storage devices
installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices.
```

The following message is displayed.

```
Please insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.
```

6. Insert the Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.

SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (Win2000)] and press **Enter**.

Then, it returns to the screen of Procedure 5.

7. Select the proper SCSI Adapter and press **Enter**.

- Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When Adaptec HostRAID (SCSI) is installed.)
- Adaptec Embedded Serial ATA HostRAID Driver for Windows 2000/XP/2003 (When Adaptec HostRAID (SATA) is installed.)
- MegaRAID SCSI 320-1 Controller Driver (When N8103-80F board is installed.)
- MegaRAID SCSI 320-2 Controller Driver (When N8103-81F board is installed.)
- Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86 board is installed.)

8. Press **R** to select the recovery option.

9. If you are requested, press **R** to select system recovery procedure.

10. If you are requested, select either of the procedure below:

[Manual Recovery] (Press **M**)

Do not select this option unless you are a high-level user or a system administrator. If you use this option, you can recover the problems of system files, partition boot sector, and start-up environment.

[Quick Recovery] (Press **F**)

This option is very easy to use and the user does not need to do anything during the procedure. If you select this option, the system recovery disk program starts to recover the problems concerning system files, partition boot sector of system disk, and start-up environment (if multiple operating systems are installed on the system).

11. Follow the instruction displayed on the screen, and then press **L** at the screen which request you to insert system recovery disk. The system will be restarted once.

NOTE: Starts the procedure without system recovery disk.

12. Repeat steps 4 to 11.

The recovery procedure will be started.

During the recovery, the missing files and the damaged files are replaced either to the files in C:\ I386 folder of hard disk drive or the files in systemroot\ Repair of the system partition. These replaced files do not reflect the changes of the configuration after the setup at all.

13. Follow the instruction displayed on the screen.

If you take a note of any file name in which trouble is detected during the procedure, it is useful to diagnose how the system has been damaged.

14. Terminates the procedure if the recovery is successful.

You can verify that the replaced files are correctly copied to the hard disk drive if the computer is restarted normally.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent NEC ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your service representative. The NEC EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow instructions.
- Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in the following ways.

- From the CD-ROM

  Set the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive and reboot the system.

  After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

  The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

  Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

  The Off-line Maintenance Utility program starts from the boot disk.

  The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the NEC EXPRESSBUILDER.

- Manual start (by pressing **F4**)

  When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk drive.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your service representative.

- IPMI Information Viewer

  Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

  Using this feature, you can find system errors and events to determine a maintenance part.

- BIOS Setup Viewer

  Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

- System Information Viewer

  Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

  Provides the function to make a back-up copy of your data.

  Without the backup data, the system-specific information and/or configuration may not be restored.

  Only the authorized personnel is allowed to restore the backup data.

- Start of Utilities

  With the NEC EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

  – System Management

  – System Diagnostics

  – Maintenance Partition Update

- Chassis Identify

  This function can distinguish the machine with the LED or buzzer of the machine. This is convenient if you have to distinguish a machine among many machines on the rack.

RESETTING THE SERVER

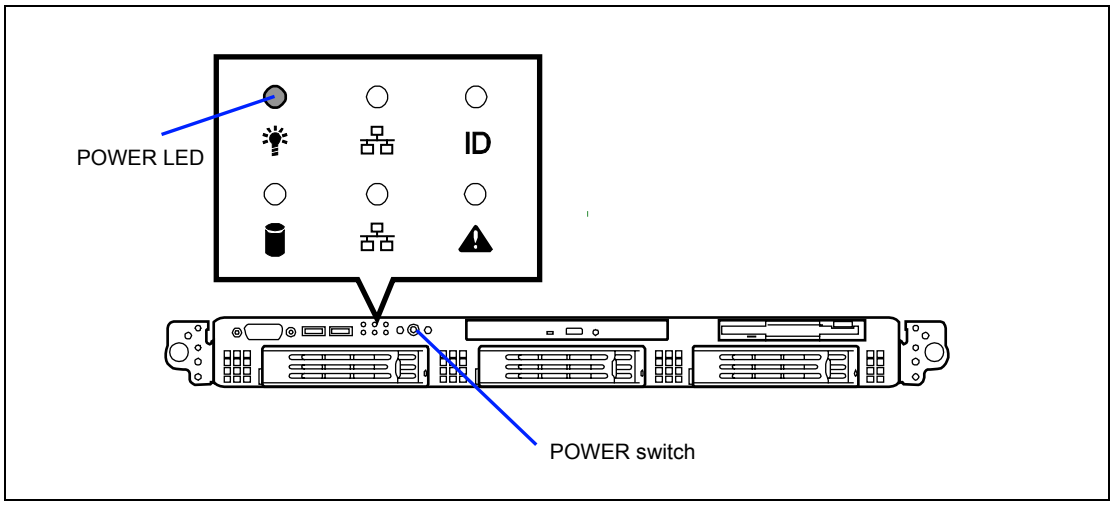
If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

IMPORTANT: Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not work.

Press and hold the POWER switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).



IMPORTANT: If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 9

Upgrading Your Server

This chapter describes internal optional devices available for the server, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by any user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user. NEC recommends you ask your service representative for install or removing any optional devices.
- Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.
- When you made any change to the hardware configuration, make sure to update the system (see Chapter 5 for details.).

SAFETY NOTES

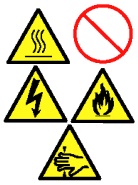
Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not look into the CD-ROM drive.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION



Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.
- Do not lift the server only by a single person.
- Do not install the server on the rack leaving the cover removed.
- Do not install the server on the rack halfway.

ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear a wrist strap (an arm belt or anti-static glove).

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.
  - Work with the server on the anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.
- Use a work table.

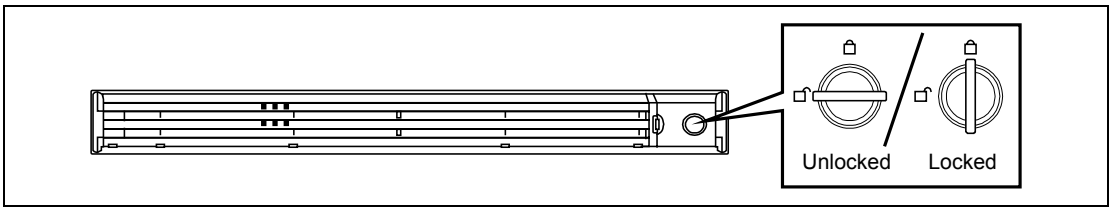
  Place the server on an anti-static mat to work with it.

- Cloth
  - Do not wear a wool or synthetic cloth to work with the server.
  - Wear anti-static shoes to work with the server.
  - Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.
- Handling of components
  - Keep any component in an anti-static bag until you actually install it to the server.
  - Hold any component by its edge to avoid touching any terminals or parts.
  - To store or carry any component, place it in an anti-static bag.

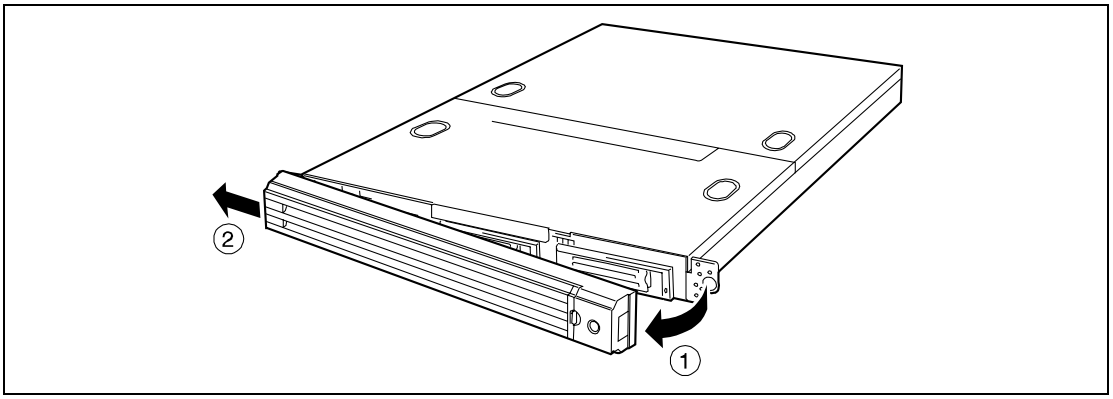
PREPARING YOUR SYSTEM FOR UPGRADE

Follow the procedure below to prepare for installing or removing components.

1. Prepare the Phillips screwdriver.
2. Shut down the OS.
3. Unlock the front bezel.



4. Remove the front bezel.
5. Press the POWER switch to power off the server (the POWER LED goes off).
6. Remove all cables and power cords from the server.



DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server in the following procedure.

Hard Disk Drive

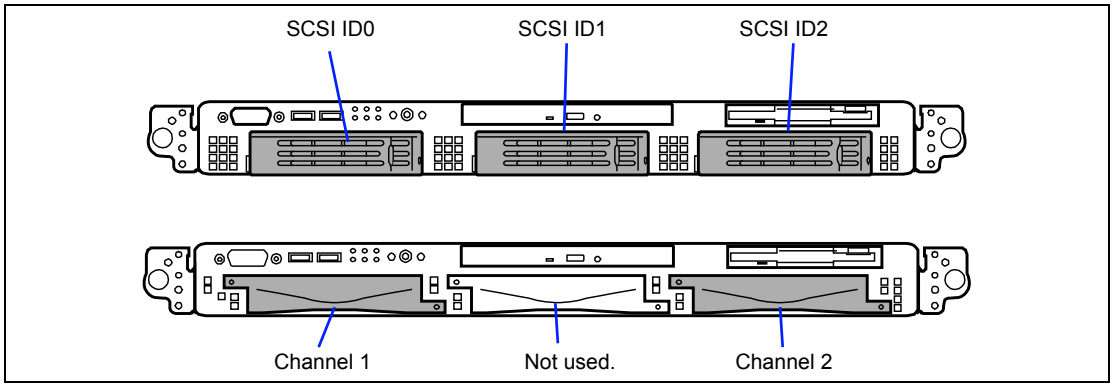
The server has three device bay slots to install hard disk drives with the SCA2 interface (Ultra 160 SCSI) in the disk bay of the front of the server.

IMPORTANT:

- Do not use any hard disk drives that are not authorized by NEC. Installing a third-party hard disk drive may cause a failure of the server as well as the hard disk drive. Purchase hard disk drives of the following models:
  <SCSI hard disk drive>
  - N8150-163F (73.2 GB, 10,000 rpm, Ultra 320)
  - N8150-171F (146 GB, 10,000 rpm, Ultra 320)
  - N8150-192 (300 GB, 10,000 rpm, Ultra 320)
  - N8150-165F (36.3 GB, 15,000 rpm, Ultra 320)
  - N8150-172F (73.2 GB, 15,000 rpm, Ultra 320)
  - N8150-193 (146 GB, 15,000 rpm, Ultra 320)

  <SATA hard disk drive>
  - N8150-184 (80 GB, 7,200 rpm, serial ATA)
  - N8150-185 (120 GB, 7,200 rpm, serial ATA)
  - N8150-186 (250 GB, 7,200 rpm, serial ATA)
  - N8150-204 (80 GB, 7,200 rpm, serial ATA2)
  - N8150-205 (160 GB, 7,200 rpm, serial ATA2)
  - N8150-206 (250 GB, 7,200 rpm, serial ATA2)
- To make array configuration, specify RAID0, RAID1 or RAID5 as the RAID level.

All drive slots may contain a hard disk drive approximately 25.4 mm (1 inch) high. The drive IDs are always assigned to hard disk drives as shown below.



The hard disk drive bays are connected to the SCSI connector on the mother board when the server is shipped. To use the hard disk drives in a disk array configuration, reconnect the cable from the connector on the mother board to which the SCSI controller is connected to the disk array controller connector. For the cable reconnection, see "Disk Array Controller".

A dummy block or tray is installed in the hard disk drive bays. The purpose of a dummy block is to increase the cooling effect in the server. Install a dummy block in slots not containing a hard disk drive.

Installation (SCSI hot-plug HDD model)

Take the following steps to install a hard disk drive. This procedure applies to all the hard disk drive bays. See the next section for the procedure installing a hard disk drive in the flex bay.

NOTE: Any hard disk drive can be installed or removed in or from the server only by removing the front bezel.

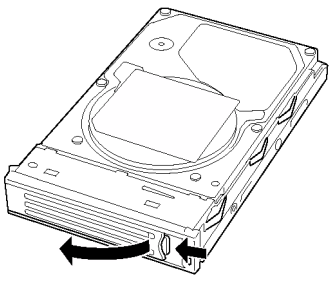
IMPORTANT:

- In the disk array configuration, use the hard disk drives having the same specification including the capacity.
- Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Locate the slot in which you are going to install a hard disk drive.

   The server has three slots. Install hard disk drives in ascending order of the SCSI ID numbers starting from the leftmost slot. The SCSI IDs assigned to the slots are all determined.
4. Remove the dummy block or tray if installed.

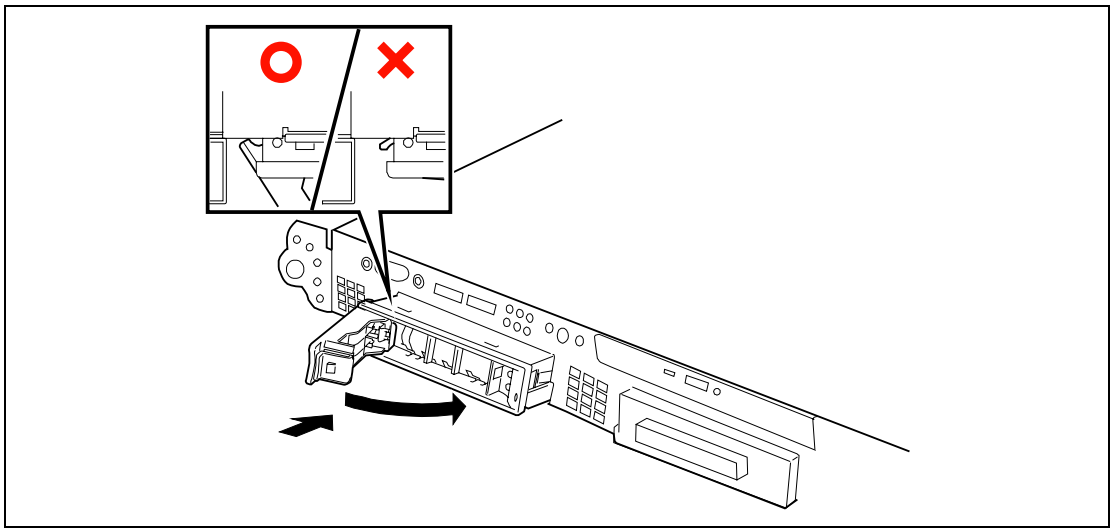
   IMPORTANT: Keep the dummy block for future use.
5. Unlock the hard disk drive handle.



6. Firmly hold the additional hard disk drive (with the tray provided) and handle, and insert it into the slot.

IMPORTANT:

- Push the hard disk drive until it docks with the SCSI backplane connector.
- Carefully hold the hard disk drive with both hands.
- Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.



7. Slowly close the handle.

The handle is locked when a "click" is heard.

IMPORTANT:

- Be careful not to get your finger caught between the handle and tray.
- Push the drive further to check if it is firmly secured.

NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

8. Install the front bezel you removed in step 2.

There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

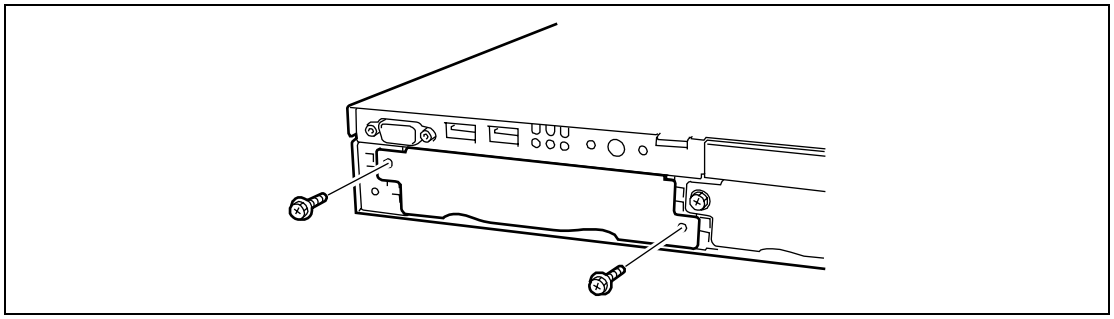
Installation (SATA fixed HDD model)

Install a hard disk in the following procedure. A hard disk drive may be installed in any other slot in the similar procedure.

> **NOTE:** Hard disk drives can be installed or removed in or from the server only by opening the front bezel.

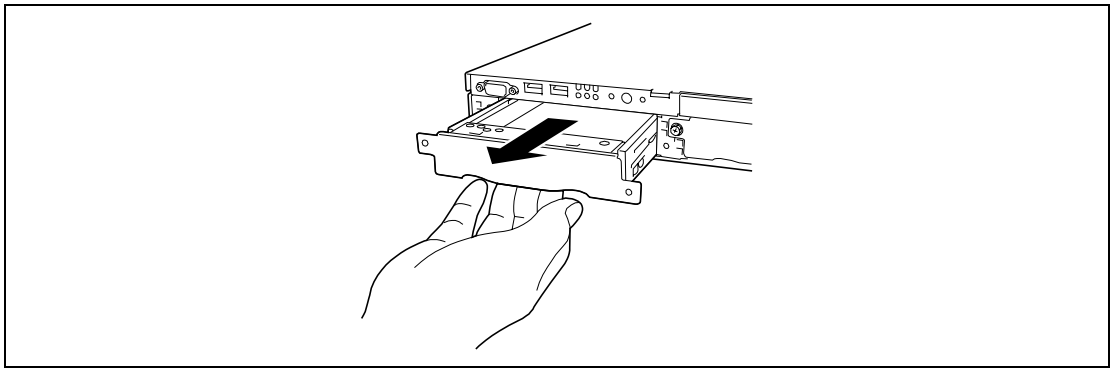
> **IMPORTANT:** In the disk array configuration, hard disk drives configuring a specific pack should have the same specification including the capacity.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock of the front bezel with the security key and remove the front bezel.
3. Check the slot in which the hard disk drive is installed.
4. Loosen two screws securing the drive carrier.



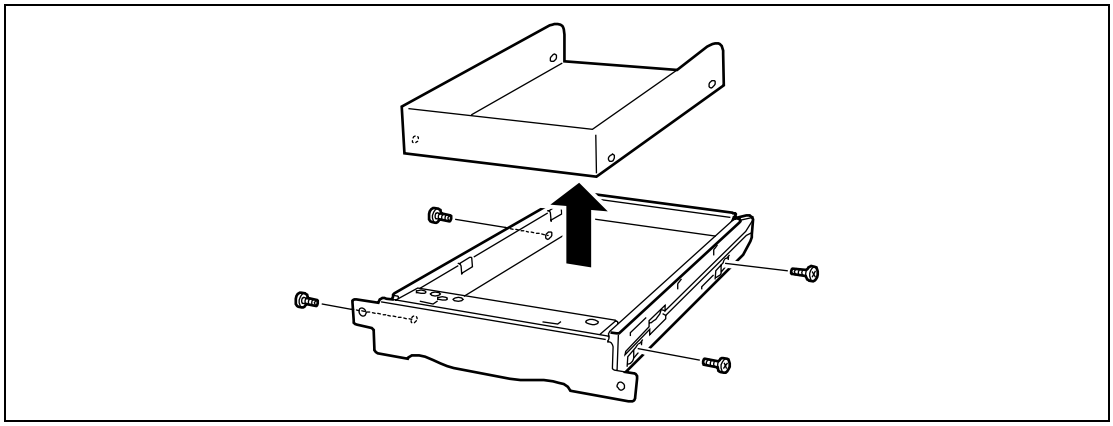
5. Remove the drive carrier.

IMPORTANT: To maintain the cooling effect in the server, install the dummy tray in the vacant slot of the disk bay.



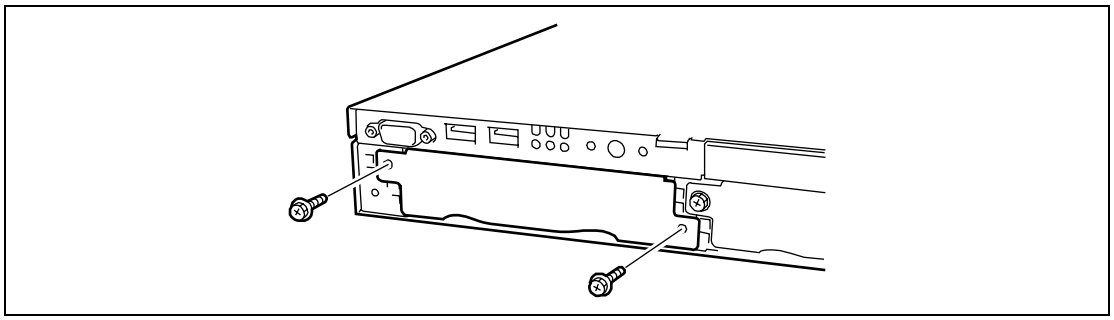
6. Remove four screws securing the drive tray.

7. Remove the drive tray from the carrier.



NOTE: Keep the drive tray for future use.

8. Place the hard disk drive onto the carrier, with its connector facing the rear of the carrier.
9. Secure the hard disk drive in the carrier with four screws removed in Step 6.
10. Install the drive carrier into the hard disk drive bay and secure the carrier to the chassis with two screws removed in Step 5.

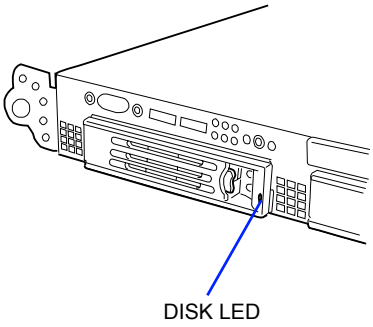


11. Reinstall the side cover.
12. Close the front bezel.

Removal (SCSI hot-plug HDD model)

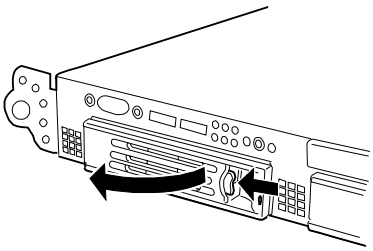
Take the following steps to remove a hard disk drive:

> **NOTE:** If removing a failing hard disk drive, confirm the slot in which the DISK LED of the hard disk drive is amber before starting the removal.



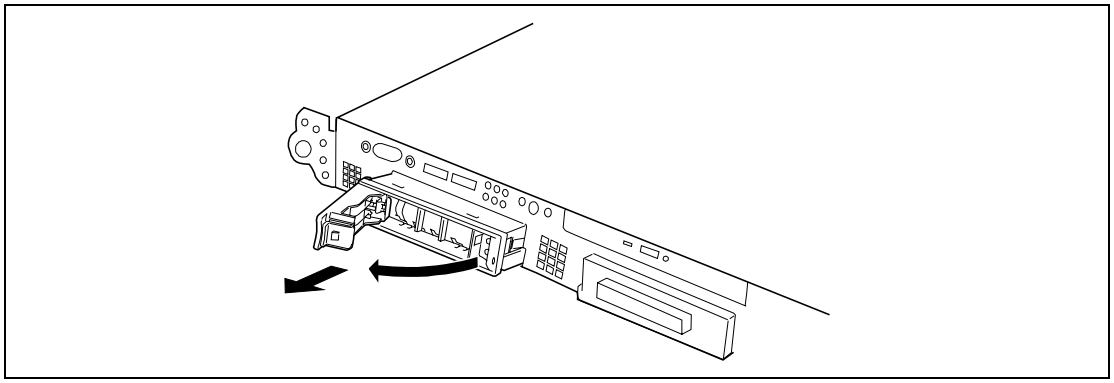
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key, and remove the front bezel.
3. Push the lever to unlock, and open the handle.

> **IMPORTANT:** Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.



4. Firmly hold the handle and hard disk drive, and pull out the hard disk drive.

5. If using the server with the hard disk drive removed, install the dummy block in the empty slot.



6. Install the front bezel you removed in step 2.

When the hard disk drives are in the disk array configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk drive into a new one.

The auto-rebuild feature is available for the RAID1, RAID5, or RAID010 disk array configuration.

Auto-rebuild is carried out when you hot-swap a failed hard disk drive with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK LED flashes green and amber alternatively to indicate it.

IMPORTANT:

- When auto-rebuild fails, the DISK LED lights in amber. Remove and install the hard disk drive again to restart auto-rebuild.
- If the disk array monitoring utility is installed, it may display or act as follows. If the DISK LED does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.
  - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.
  - Appears to stop and restart auto-rebuild.

Observe the following notes for auto-rebuild.

- Do not power off the server in the period between a hard disk drive error and completion of auto-rebuild.
- When you removed a hard disk drive, wait at least 90 seconds before installing the hard disk drive back again.
- Do not replace another hard disk drive while rebuilding is in progress. (The DISK LED flashes in green and amber alternatively while rebuilding the hard disk drive.)

Removal (SATA fixed HDD model)

Remove the hard disk drive in the reverse procedure of the installation.

In the disk array configuration, the auto rebuild function can be used. The auto rebuild function can record the information saved in a defected hard disk drive into the new replaced disk to recover the server to the state before the occurrence of the fault.

The auto rebuild function is valid for disk arrays set to RAID1.

See Chapter 4 for detail explanation.

Power Supply Unit (SCSI Hot-plug HDD Model)

Your server contains one or two power supplies.

The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails.

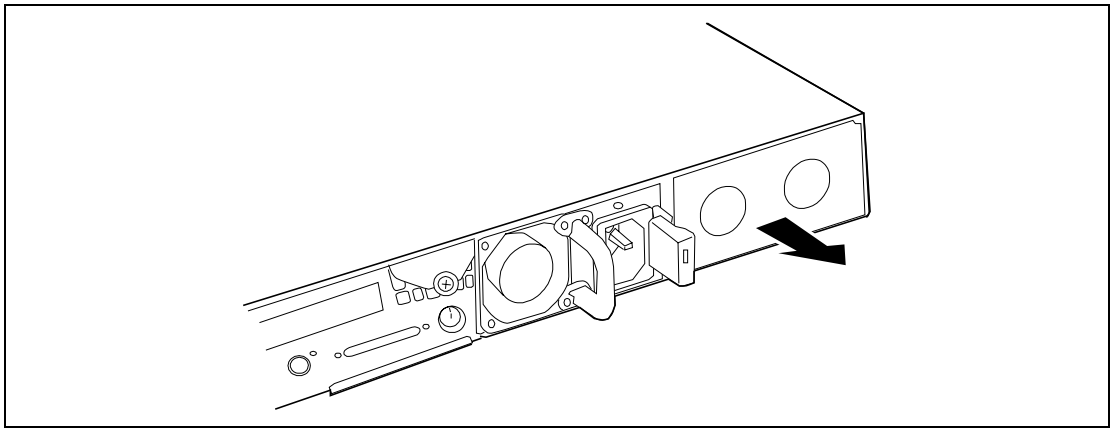
Installation

Take the following steps to install a power supply unit:

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

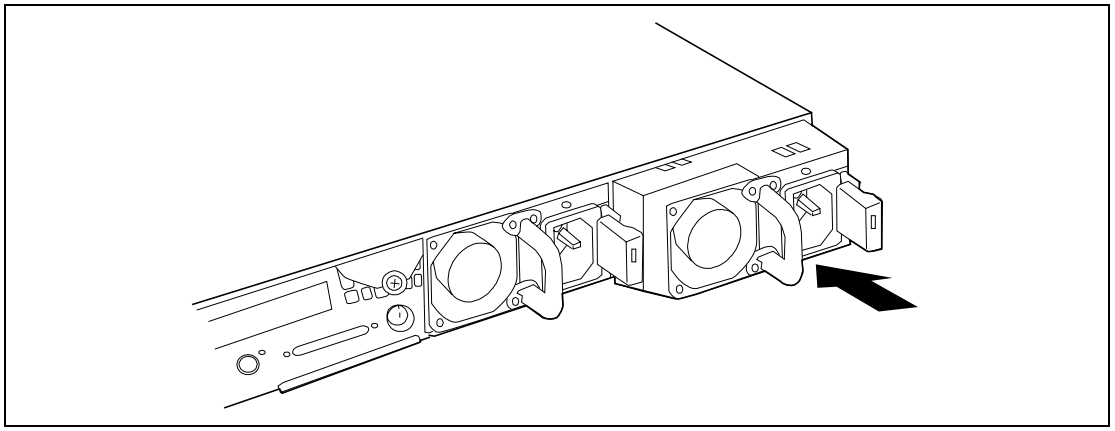
   IMPORTANT: Be sure to turn off the power. Failure to do so causes the server to malfunction or fail.

2. Pull the cable arm toward the rear of the server, and confirm the slot for installing an optional power supply unit.
3. Hold and pull the lever of the blank cover and remove the blank cover.

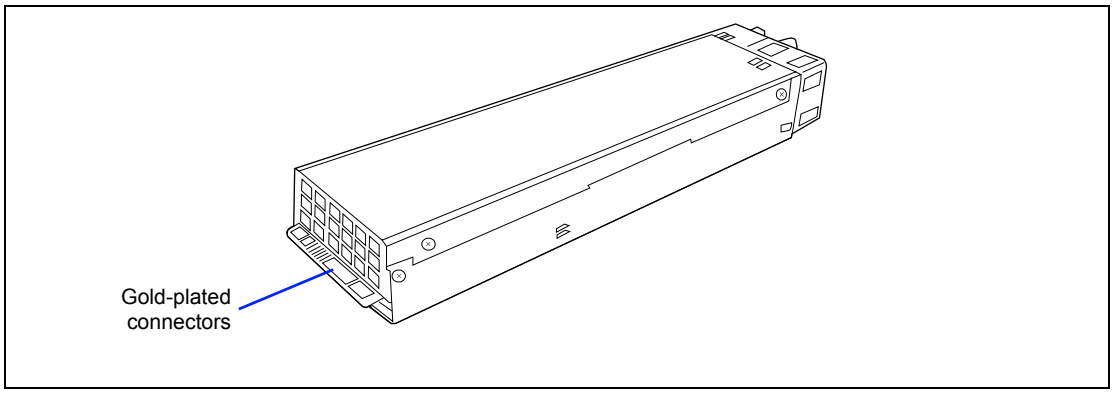


IMPORTANT: Keep the removed blank cover for future use.

4. Insert the power supply unit.

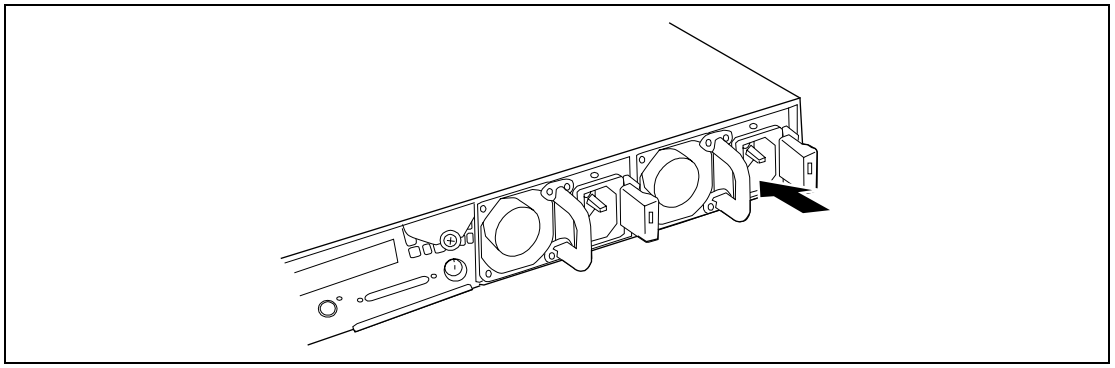


IMPORTANT: Do not touch the terminals of the power supply unit.



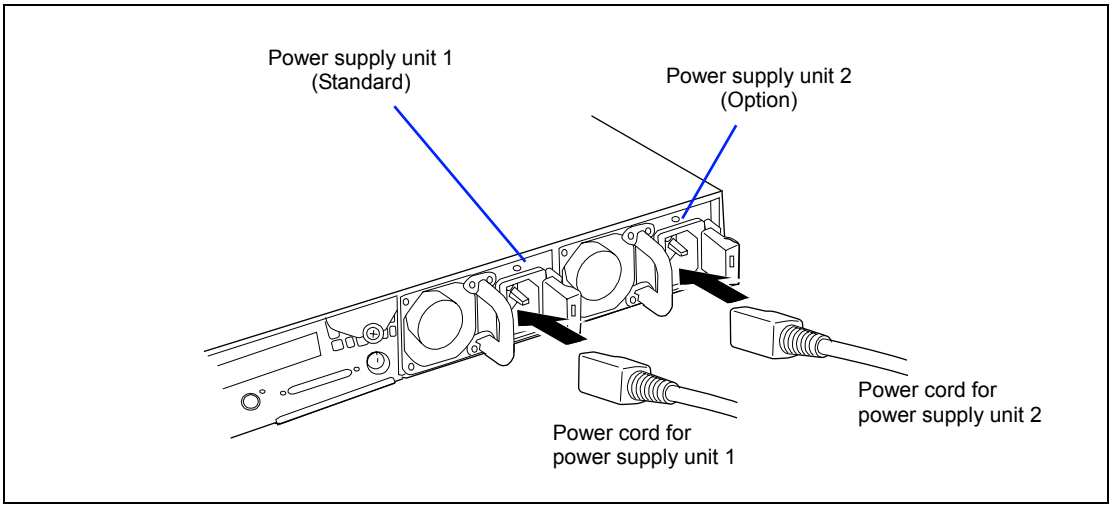
5. Grasp the handle and firmly push the power supply.

The power supply unit is locked when a distinct "click" is heard.



6. Connect two power cords.

Use the power cord provided with the standard power supply unit and the one provided with the system. The AC POWER LEDs flash when the power cords are connected.



7. Power on the server.

The AC POWER LEDs go on.

8. Confirm, by the STATUS LED or on the POST screen, that there are no errors related to the power supply units.

See Chapter 8 for details on the error messages.

If the AC POWER LEDs are off, reinstall the power supply units. If the same error message still appears, contact your sales representative.

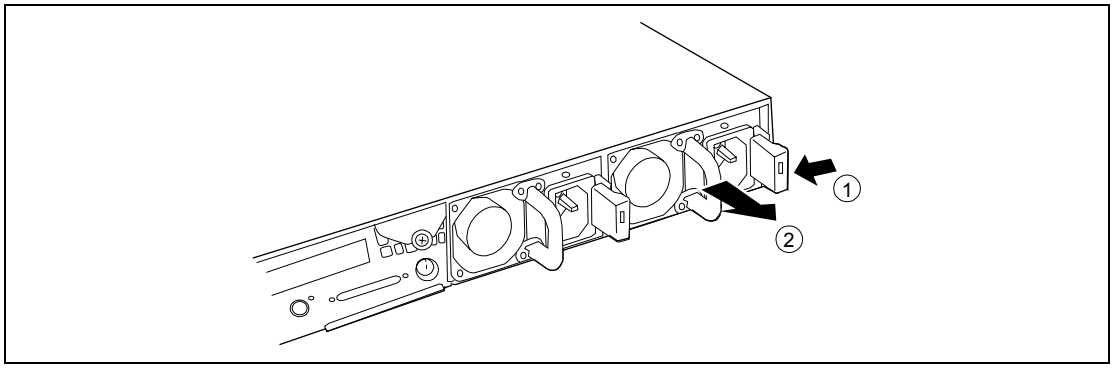
Replacing a Failing Power Supply Unit

Replace only a failing power supply unit.

> **IMPORTANT:** Do not remove a power supply unit operating normally.

> **NOTE:** If one power supply unit fails while the server contains two power supply units in a redundant configuration, the failing power supply unit can be replaced with the system operating (power-on state). (Skip step 2.)

1. Locate the failing power supply unit by the AC POWER LED on the rear of each power supply unit. (The LED of the failing power supply unit is amber.)
2. Shutdown the system, and press the POWER switch to turn off the power.
3. Disconnect the power cord from the failed power supply.
4. Hold the handle of the failing power supply.
5. While pressing the lever, pull the power supply to remove if from the chassis.



6. If operating the server with a single power supply unit without installing a new one, install the cover you removed in step 3 of installation procedure.

> **IMPORTANT:** To maintain the cooling effect in the server, install the blank cover in the vacant slot.

7. Install the new power supply unit taking steps 4 to 8 of "Installation", and confirm that the power supply unit is installed normally.

> **NOTE:** If one of the two power supply units of the server is replaced while the power is on, the POWER LED of the new power supply unit goes on. (If it is replaced while the power is off, the LED flashes. The LED goes on when the power is turned on.)

Server (Pull-out from the Rack)

The server needs to be pulled out from the rack for installing/removing any components other than the hard disk drives and power supply units.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

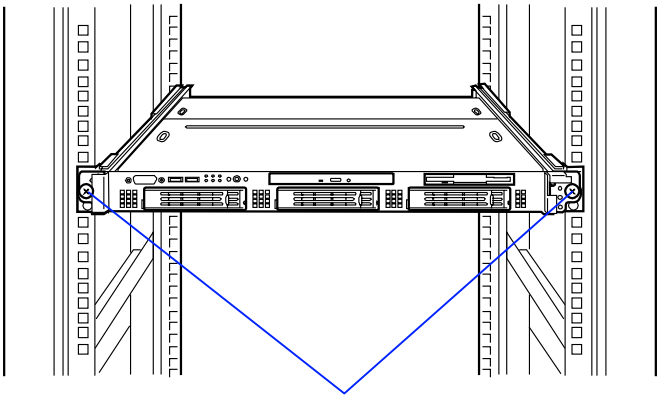
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

NOTE: To confirm the device you are going to maintain, use the UID switch and the UID LED that goes on when the switch is pressed.

2. Loosen the thumb screws at the right and left of the front panel, hold the handles, and slowly pull out the server from the rack.

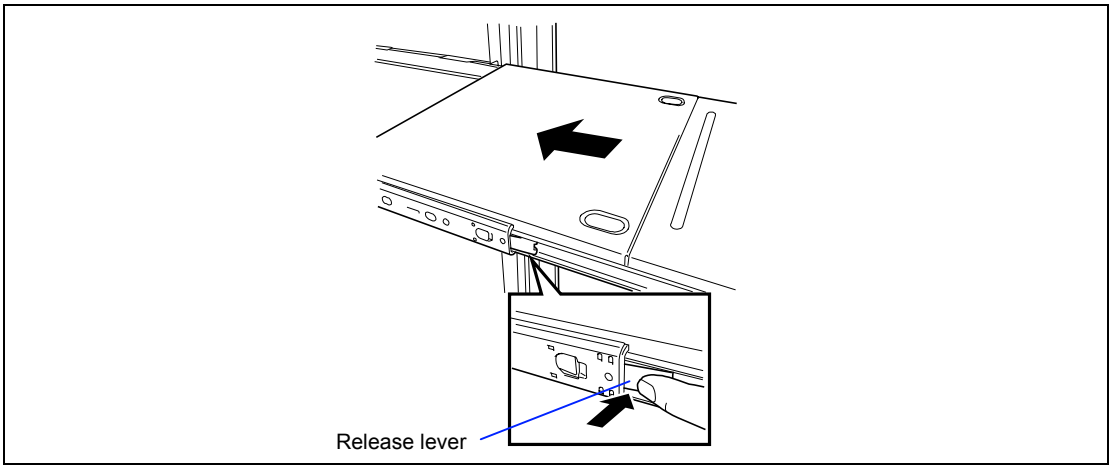
The server is locked while you are pulling it. Stop pulling when it is locked.



Captive thumb screws

To place the server in the rack, push it back into the rack while pressing the right and left lock arms.

IMPORTANT: Be very careful not to get your finger caught in the arms or rails.

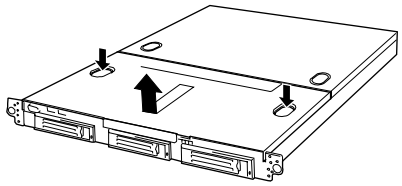


Drive Cover

Open the drive cover when installing/removing a fan assembly, processor, and backup file device or reconnecting an internal cable.

Removal

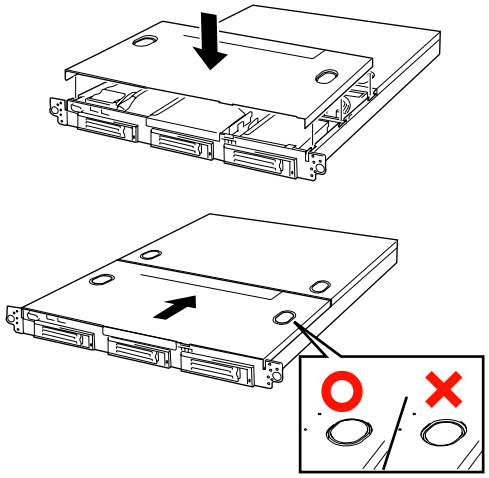
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Slide the drive cover toward the rear of the server while pressing the lock button on the cover.
4. Lift off the drive cover from the server.



Installation

When installing the drive cover, confirm that the tab of the cover is securely inserted into the slot in the server frame.

Slide the drive cover toward the rear of the server. The drive cover is locked when a distinct "click" is heard. At this time, check the release button for normal state.

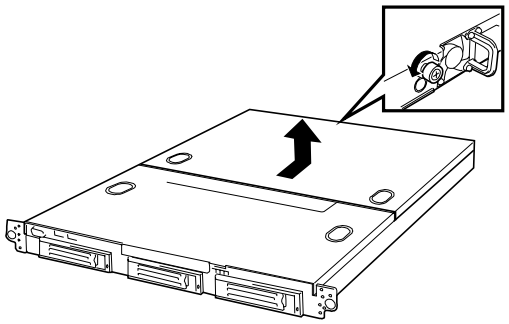


Logic Cover

Open the logic cover when installing/removing a DIMM, processor, and PCI add-in card or reconnecting an internal cable.

Removal

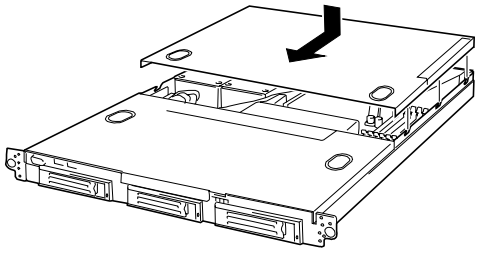
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Loosen a captive thumbscrew at the rear of the server.
4. Slide the logic cover toward the rear of the server and lift off the cover from the server.



Installation

When installing the logic cover, confirm that the tab of the cover is securely inserted into the slot in the server frame.

Slide the logic cover toward the rear of the server and secure the cover with captive thumbscrew.



NOTE: If the logic cover cannot be closed firmly, remove the drive cover before installing the logic cover.

DIMM

Install the additional DIMM (Dual Inline Memory Module) to the DIMM socket on the mother board in the server. The mother board is provided with eight DIMM board slots.

NOTE: Up to 16GB of memory (2GB DIMM x 8) can be installed. (The factory-installed DIMMs need to be replaced in this case.) Two DIMMs of 512MB are installed in DIMM slots #7 and #8 at shipment.

IMPORTANT:

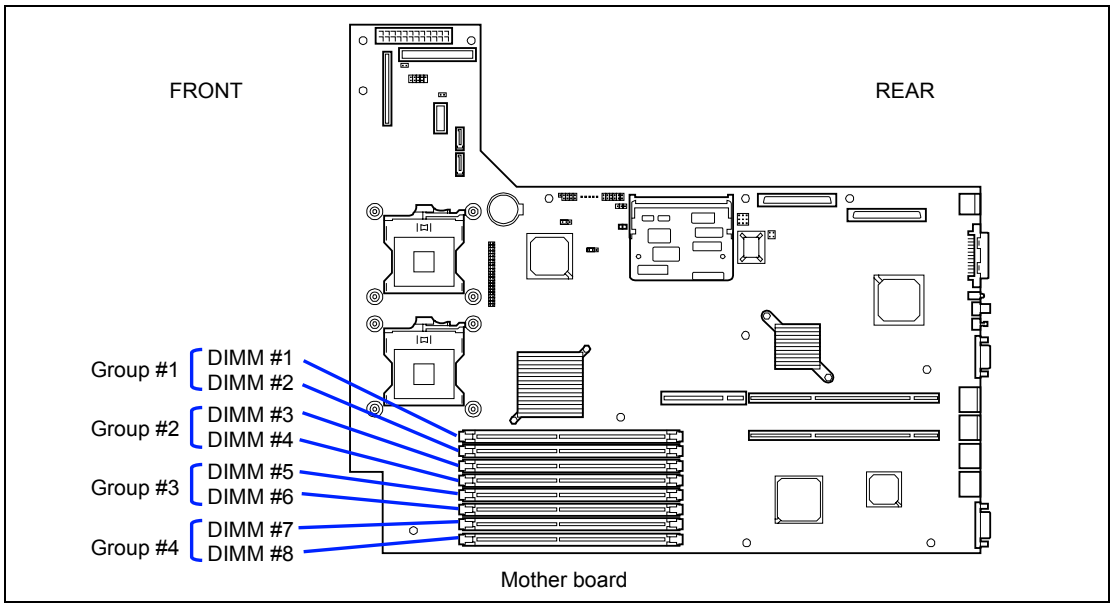
- The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

Installation Order

DIMMs must be populated in pairs and in the following order:

#7 and #8, #5 and #6, #3 and #4, then #1 and #2.

Install DIMMs starting from the one having smallest capacity.

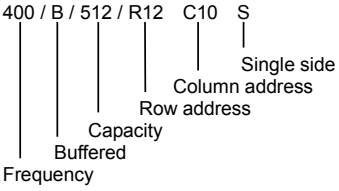


IMPORTANT: Install two additional DIMMs for each group[*1] because the server uses interleaved memory. If DIMMs of different specifications[*2] are installed in a bank, the server does not operate normally.

*1 A group is a unit of two DIMM slots. Each pair of DIMM slots #1 and #2 (group #1), #3 and #4 (group #2), #5 and #6 (group #3), and #7 and #8 (group #4) in the figure is a group. (The symbols are also printed on the mother board.)

*2 DIMM specification is shown on the label attached to the DIMM as follows:

Example: Frequency of 400 MHz, buffered, capacity of 512 MB, row address of 12 bits, column address of 10 bits, and single side



Installation

Install a DIMM in the following procedure.

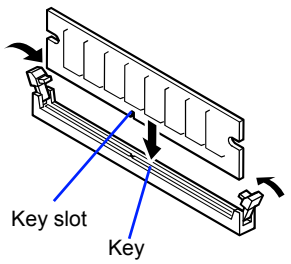
> **IMPORTANT:** The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the logic cover.
4. Push the DIMM straight into the socket.

> **NOTE:** Make sure of the orientation of the DIMM.
> Position the DIMM so that a notch in the bottom edge of the DIMM aligns with the keyed socket. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

> **IMPORTANT:** To avoid damage to the socket, do not apply excessive force while pressing the DIMM.

The levers automatically close when the DIMM is inserted into the socket.



5. Install the components you removed in steps 1 to 3.
6. Power on the server and verify that POST displays no error messages.

   If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.
7. Start the SETUP and select [Advanced] → [Memory Configuration] to verify that the installed DIMM shows the status "Normal". (See Chapter 4 or details.)
8. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.

   This setting is required to change the hardware configuration data. See Chapter 4 for details.
9. If the Windows operating system is in use, set the paging file size to the recommended value (total memory size × 1.5) or a greater value. See Chapter 5 for details.

Removal

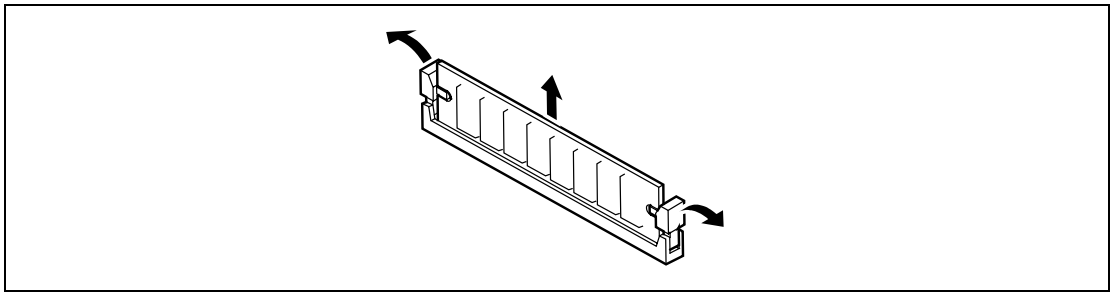
Remove the DIMM depending on the following procedure.

NOTES:

- To remove the failed DIMM, check the error message appearing in POST or NEC ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.
- The server operates only when at least two DIMMs are installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the logic cover.
4. Open the levers at both sides of the socket from which you remove the DIMM.

   The DIMM is unlock and ready for removal.



5. Reinstall all parts removed in Step 2.

   Power on the server and verify that POST displays no error messages.

   If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

6. Start the SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information of the removed DIMM. (See Chapter 4 for details.)
7. Select "Yes" for [Reset Configuration Data] on the Advanced menu.

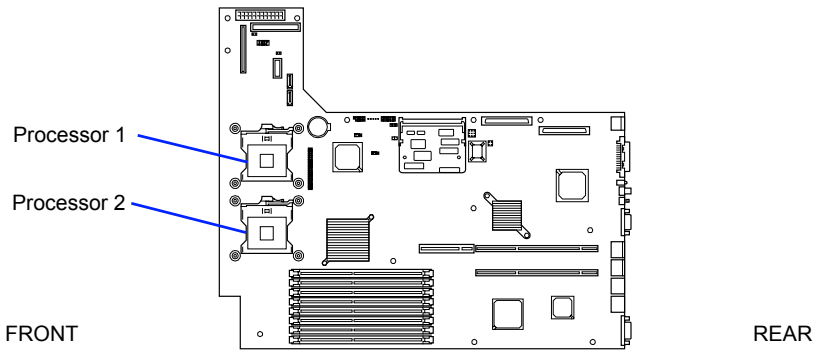
   This setting is required to change the hardware configuration data. See Chapter 4 for details.

Processor (CPU)

The server may have another CPU installed in addition to the standard CPU (Intel® Xeon® Processor).

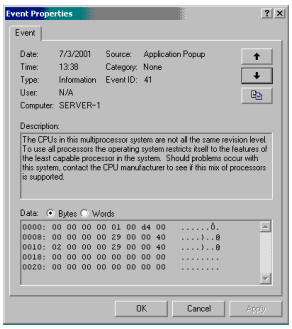
IMPORTANT:

- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Do not operate the system until confirming that the additionally installed CPU is in normal state.
- Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.



Mother board

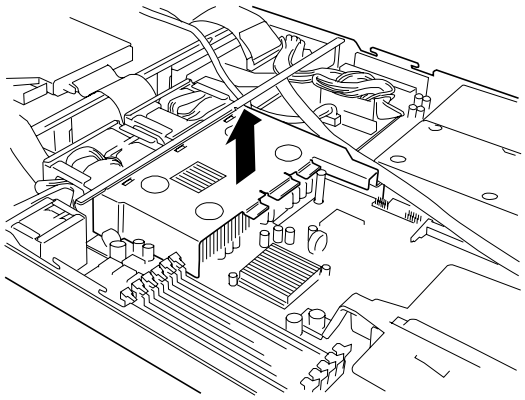
NOTE: If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.


Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 44 00 ......D.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

Installation

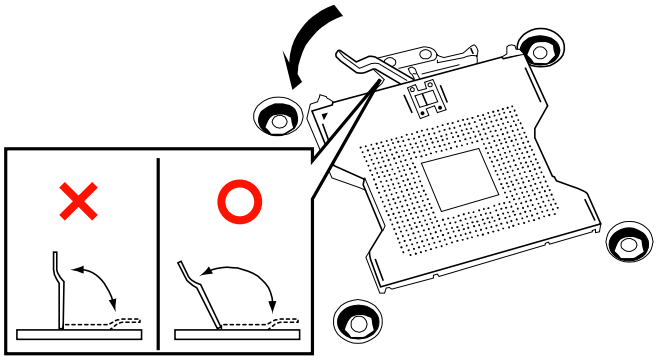
Take the following steps to install the CPU.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the drive cover and logic cover.
4. Remove two screws securing the support arm.
5. Remove the support arm from the chassis.
6. Remove the processor duct from the chassis.



7. Locate the CPU socket which you are going to install CPU.
8. Raise the locking lever on the socket.

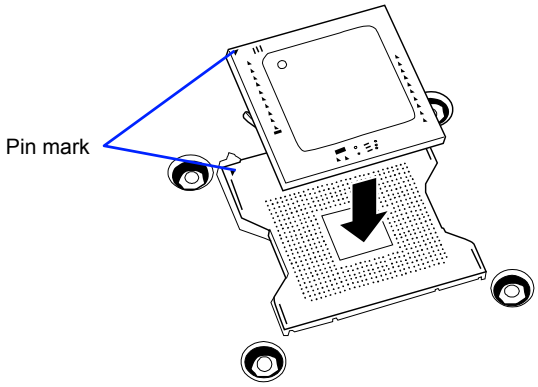
IMPORTANT: Open the lever until it stops. The bar can be opened to approx. 120 degrees.



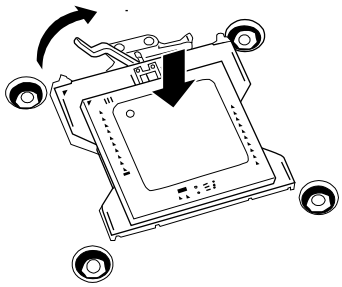
9. Aligning the pins of the CPU with the socket, insert the CPU slowly and gently into the socket.

IMPORTANT:

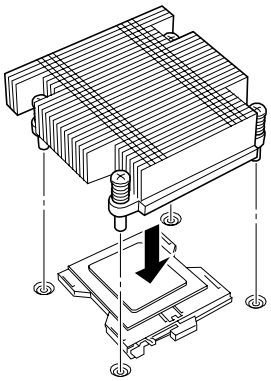
- Be aware of CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the CPU correctly.
- The mother board has "zero insertion force" sockets. If CPU does not drop easily into socket holes, make sure lever is in the full-open position.



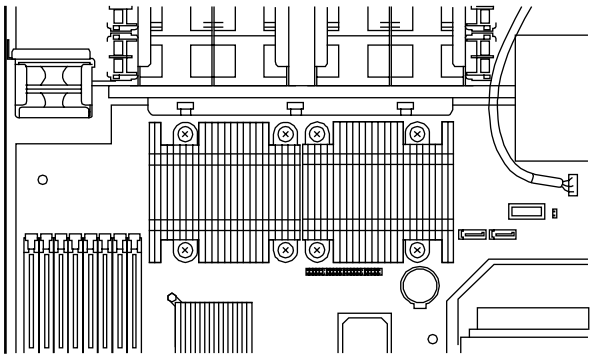
10. Push the CPU lightly to the socket, and push down the lever to secure the CPU.



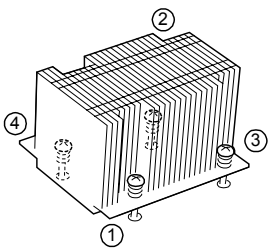
11. Put the heat sink on CPU.



NOTE: Be aware of direction of heat sink (see figure below).



12. Fix the heat sink clips with four screws.

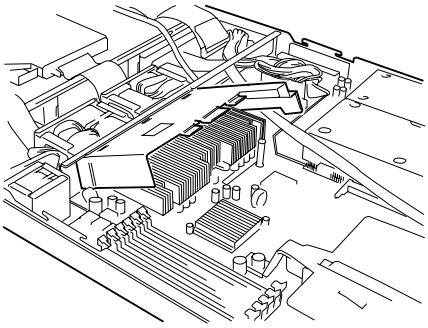


13. Make sure that the heat sink is level.

NOTES:

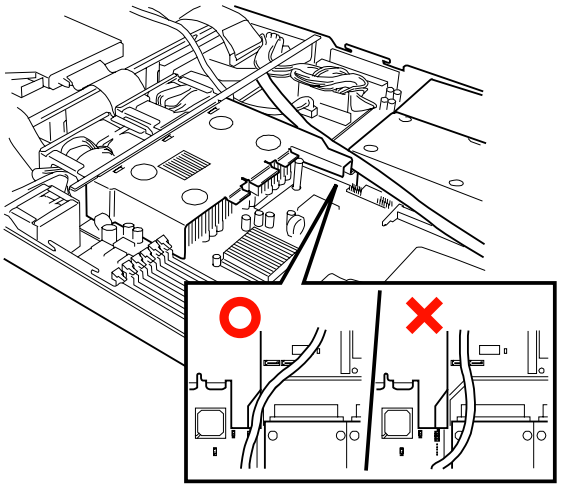
- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - All screws are not completely tightened.
- Do not move the secured heat sink.

14. Install the processor air duct.



NOTE: Put the SCSI cable through the tunnel under the full-length riser card receiver of the bracket. Attach the bracket while making sure that the cable is not caught in the bracket. Also make sure that the signal cable from the power supply unit that runs through the slit on the left side of the bracket is not caught when attaching the bracket.

Lay the SCSI cable as shown in the figure below.



15. Install the covers you removed previously.

16. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".

17. Verify that POST displays no error messages.

    If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

18. Set "Reset Configuration Data" on the Advanced menu to "Yes".

    This setting is required to change the hardware configuration data. See Chapter 4 for details.

19. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 5).

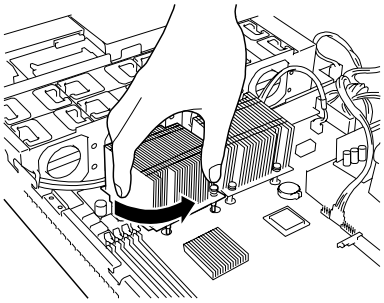
NOTE: Step 19 is required when the Hyper-threading technology feature is disabled in the BIOS SETUP Utility.

Removal

To remove the CPU, prepare the removal referring to steps 1 and 6 in the installation procedure and do the reverse procedure of steps 12 to 8.

IMPORTANT:

- Do not remove any CPU unless it is failed.
- Install the dust cover onto the vacant processor socket.
- After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defected.



Do the following procedure if a CPU is removed (or replaced).

1. Start SETUP to select menus "Main" – "Processor Settings" – "Processor Retest" in the order to clear the error information on the removed CPU (see Chapter 4).

   When a CPU is replaced, select menus "Main" – "Processor Settings" to confirm that the ID and L2 Cache of the additional CPU are defined normally (see Chapter 4).

2. Set "Reset Configuration Data" on the Advanced menu to "Yes."

   This is required to update the hardware configuration information. See Chapter 4 for details.

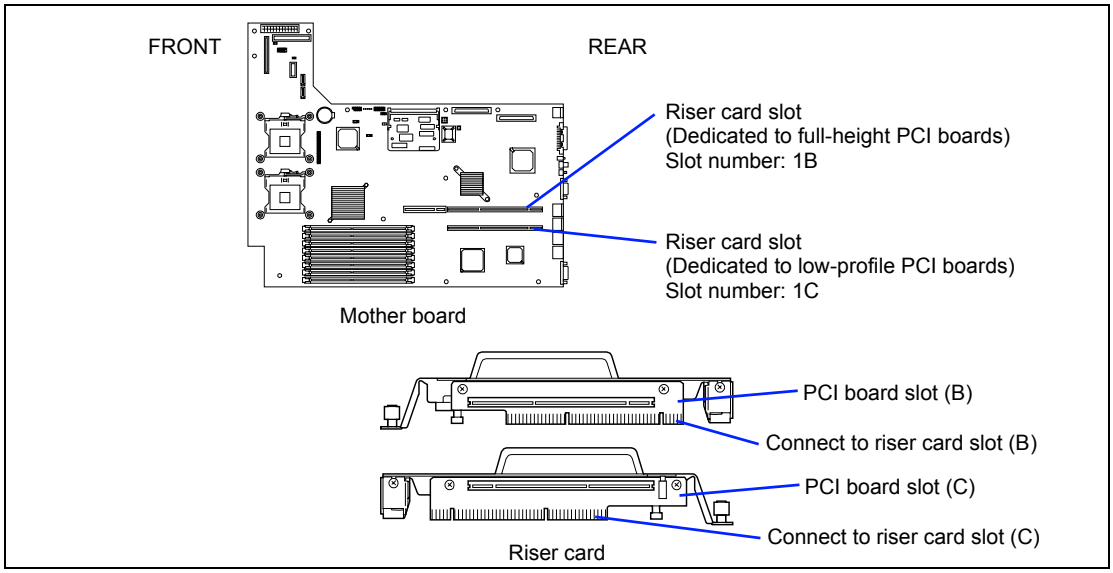
PCI Board

The server has a riser card assembly on the mother board that enable installation of PCI boards. The riser card assembly can hole up to two PCI boards.

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.

IMPORTANT:

- The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. For static notes, see the section "Anti-static Measures".
- Some restrictions are imposed on the combination of PCI boards which can be installed in the server. Contact your service representative for details.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- Disable the option ROM (such as BIOS utility startup) for the PCI slot if the SCSI controller, disk array controller, LAN board (network booting), or FibreChannel controller has no hard disk drive containing an OS connected. See Chapter 4 for details.



Notes

Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- PCI slot number "1C" is assigned to the riser card for low-profile PCI boards, and "1B" is assigned to the riser card for full-height PCI boards.
- The system detects the boot devices in order of the PCI bus slots 1C (low-profile PCI board) and then 1B (full-height PCI board).
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or disk array BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

	Bus number	Device number	Function number
Onboard NIC1	2	1	0
Onboard NIC2	2	1	1
Slot 1C	2	2	X
Onboard SCSI Ch A (external)	2	3	0
Onboard SCSI Ch B (internal)	2	3	1
Slot 1B	3 *	7	X

* The bus number may be 5 or greater depending on the board installed in Slot 1B.

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS SETUP utility.
- If an additional LAN device is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.
- If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed. After the additional installation, start the BIOS SETUP utility, select [Boot] and set the new boot priority.
- Contact your service representative for the acceptable optional PCI board.

Installation

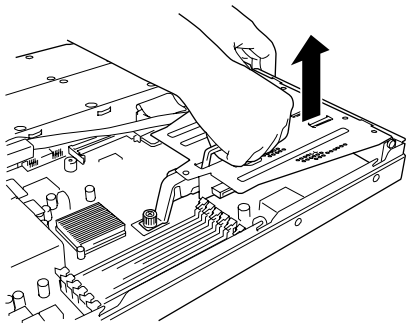
Take the following steps to install a PCI board on the riser card:

IMPORTANT: The full-height riser card is equipped with an "insulator (black)" to protect PCI boards. Do not remove the insulator, and handle it carefully. The insulator is not shown in the figures in this manual for simplifying the illustrations.

NOTES:

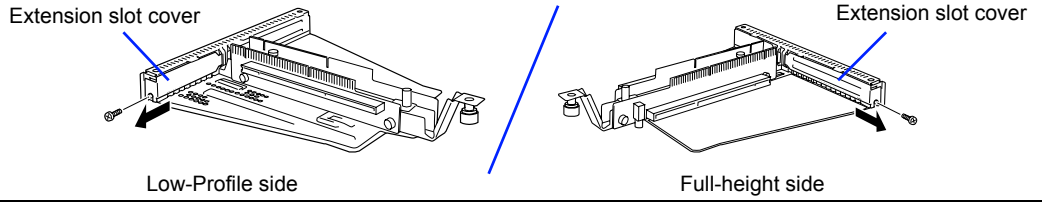
- Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, confirm that the type of the PCI board.
- When installing a PCI board, confirm that the card connector matches the connector of the riser card.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the drive cover and logic cover.
4. Grasp a handle on the riser card assembly and lift straight up and remove the riser card from the server.



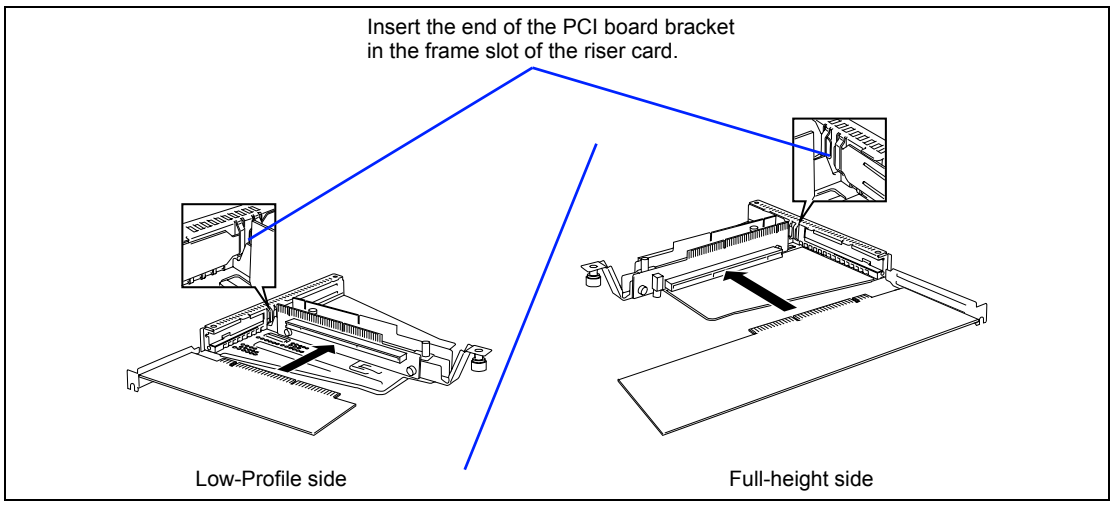
5. Remove the screw from the riser card, and remove the extension slot cover.

NOTE: Keep the removed extension slot cover for future use.



6. Install the PCI board on the riser card.

Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.



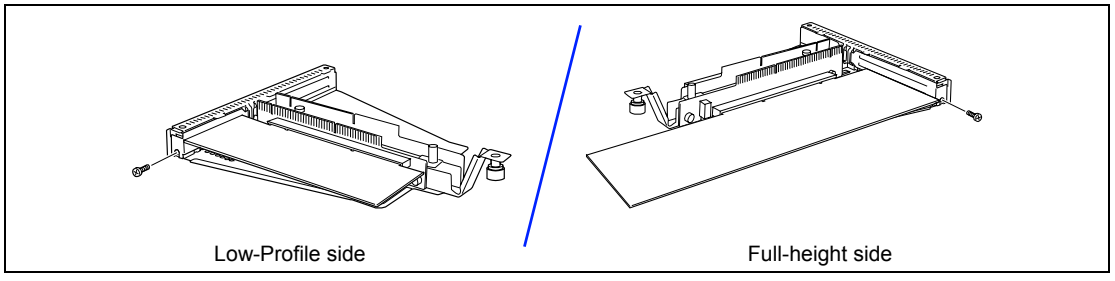
IMPORTANT:

- Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
- If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.

NOTE: Confirm that the end of the PCI board bracket is inserted in the frame slot of the riser card.

7. Secure the PCI board with the screw you removed in step 5.

IMPORTANT: This step is to protect the terminals of the riser card from dust or fingerprints. Dust and fingerprints left on them cause the server to malfunction.

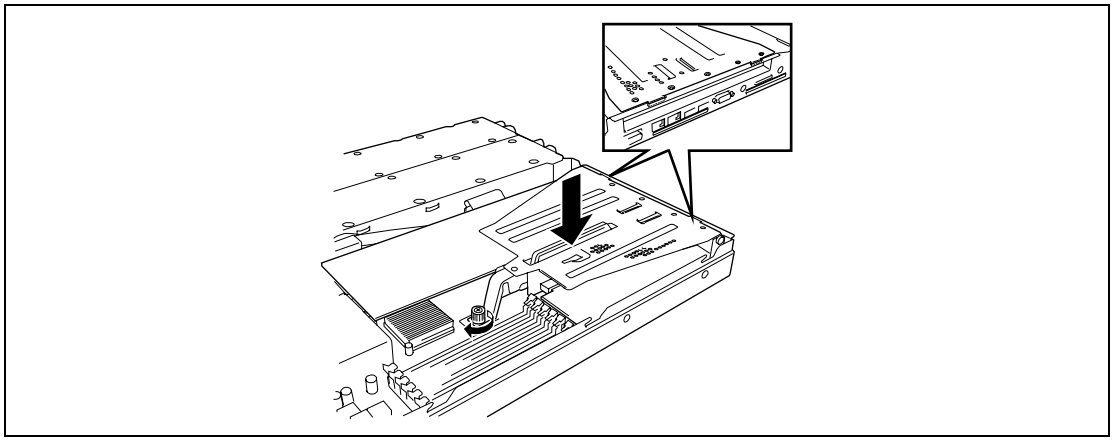


8. Insert the riser card assembly into the slot on the mother board.

Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.

NOTE:

- There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.
- Pay attention not to damage the components on mother board with the riser card when inserting it into the slot.



9. Install the components you removed previously.

10. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

11. Run the BIOS SETUP utility and select "Yes" for [Advanced] → [Reset Configuration Data].

This setting is required to change the hardware configuration data. See Chapter 4 for details.

Removal

Remove a PCI board in reverse order of the installation steps.

RAID Controller Board

Using the optional RAID controller allows you to use hard disk drives in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.

IMPORTANT:

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Making hard disk drives in the disk array configuration or changing the RAID level initializes hard disk drives. If the hard disk drive to be configured in the array has your valuable data stored, make sure to make a backup copy of the data in another hard disk drive before installing the disk array controller board and configuring the array.
- The disk array configuration requires at least two hard disk drives.
- Use hard disk drives of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.

NOTES:

- Before installing a disk array controller board, start the SETUP utility, select [Advanced] → [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).
- A disk array configuration of RAID1 or RAID5 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk drive capacity in the disk array configuration.

When you use the onboard RAID controller, refer to the following documentation.

- SCSI RAID controller: Online document in the NEC EXPRESSBUILDER CD-ROM
- SATA RAID controller: Chapter 4 in this manual

Installation

See "PCI Board" for the installation of a SCSI RAID controller.

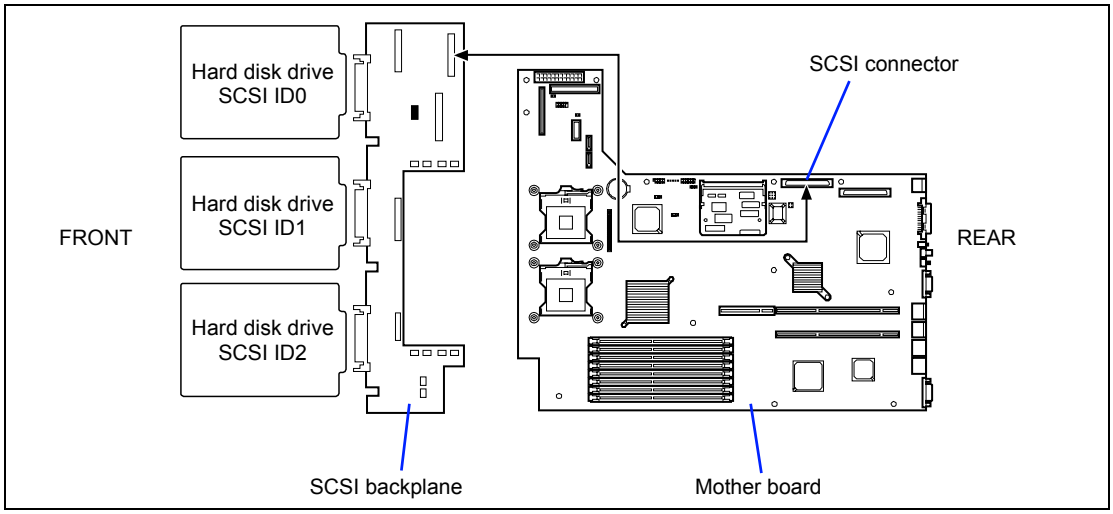
Removal

Remove a SCSI RAID controller board in reverse order of the installation steps.

Use of internal hard disk drives in a RAID configuration

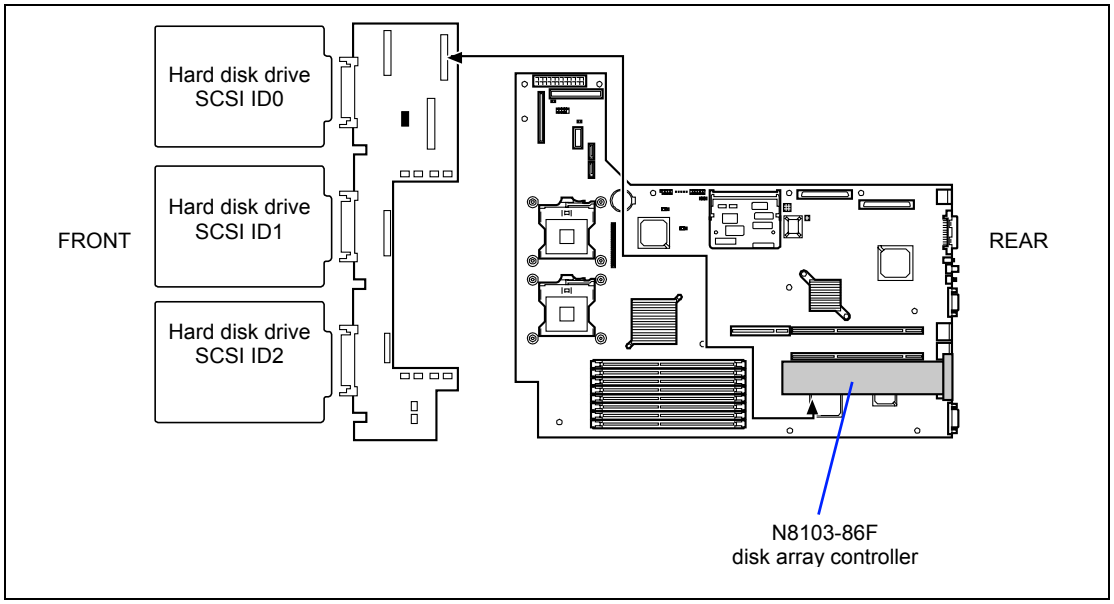
To use the internal hard disk drives in a RAID configuration in the server containing an optional SCSI RAID controller, reconnect the SCSI cables on the mother board to the disk array controller.

The internal hard disk drive interface is connected to the SCSI connector on the mother board at shipment.

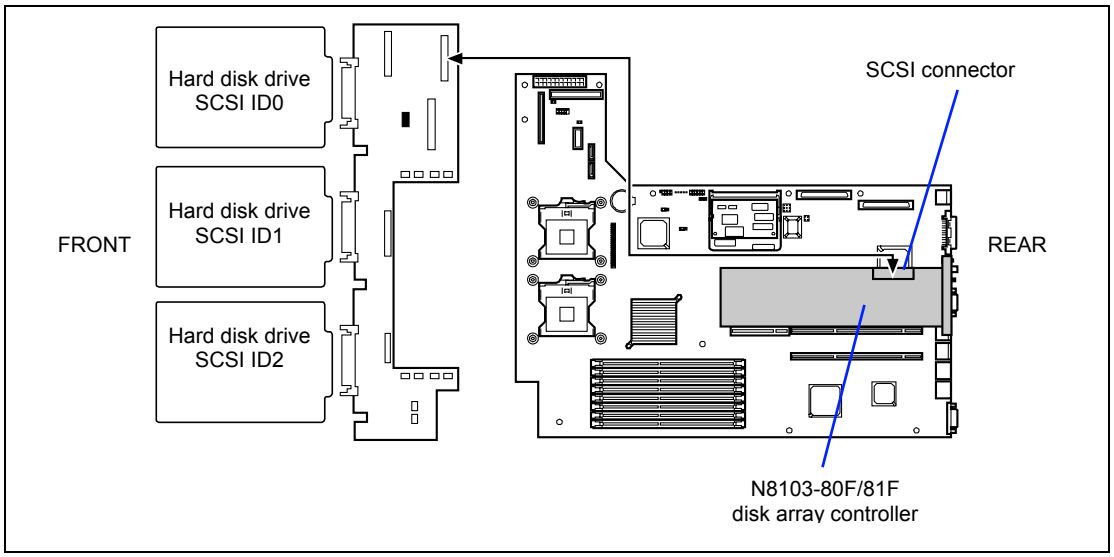


The following figures show the example of cable connection for RAID configuration.

Connecting SCSI cable to optional RAID controller in low-profile PCI slot



Connecting SCSI cable to optional RAID controller in full-height PCI slot



IMPORTANT: Some disk array controller boards have more than one channel (connector). They may have connectors for internal connection and external connection. However, the connectors may be under exclusive specification in consideration of the internal connection of the disk array controller board. Make sure that each connector (channel) is for internal connection or external connection. For the connectors and channels, see the manual provided with the disk array controller board.

- Example of connecting the SCSI cable

  This section explains the procedure for connecting the internal hard disk drives to the N8103-80F disk array controller board installed on the riser card dedicated to low-profile PCI boards.

1. Remove the fan duct.
2. Install the N8103-80F to the low-profile side of the PCI riser card assembly.
3. Disconnect the SCSI cable from the mother board.
4. Connect the connector of the SCSI cable to the disk array controller.

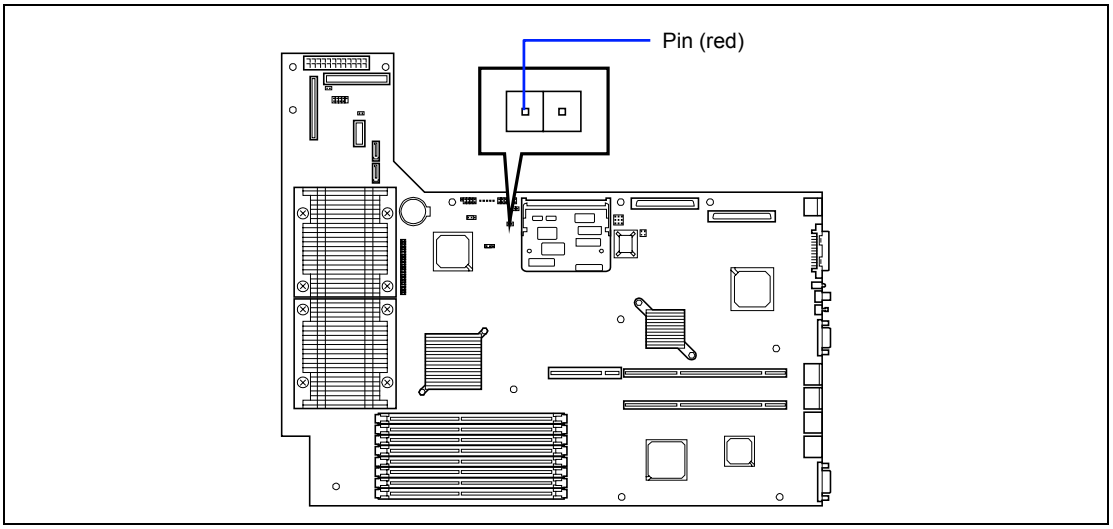
■ LED relay cable connection

To indicate the status of access to the internal hard disk drives in a disk array configuration, connect the LED relay cable (connected on the mother board) to the HDD LED connector of the disk array controller.

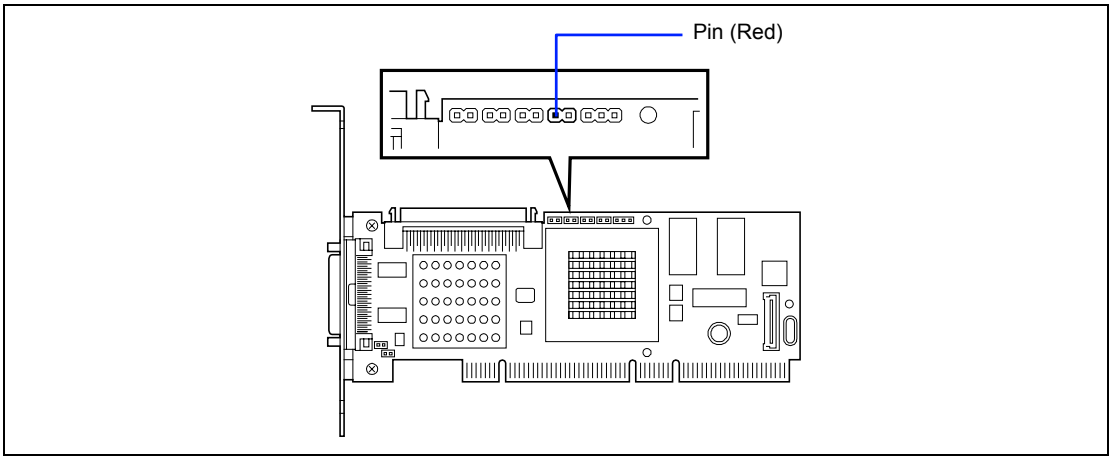
1. Connect the LED relay cable connector (black) to the LED Active pin on the disk array controller.

   Connect the pin having the red cable to the LED Active pin. Do not connect any pin having the black cable.

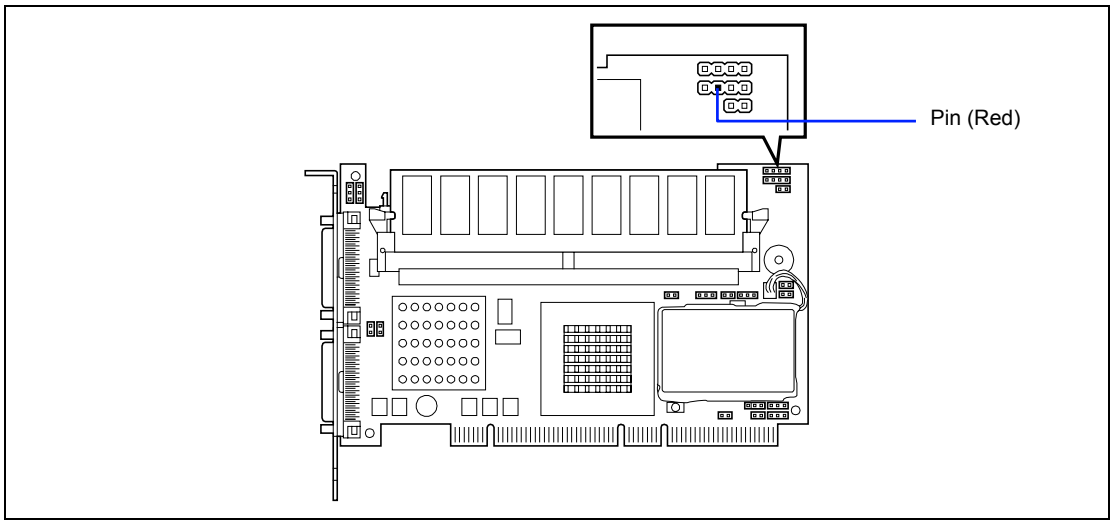
2. Confirm that the LED relay cable connector (brown) is connected to the HDD LED connector on the mother board.



N8103-80F



N8103-81F



- Disk array configuration of internal hard disk drives

  Observe the following notes on configuring a disk array:

  – The server must contain more than one SCSI hard disk drive having the same capacity and the same rotational speed. (The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).)

  – Select/set a RAID level "RAID0", "RAID1", or "RAID5" of disk array configuration.

  When installing a system in an internal hard disk drive, you should use "Express Setup" to perform all the procedures for RAID configuration, OS installation, and then OS setup.

  Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID configuration, maintenance partition setting, and then maintenance utility installation.

  When making the setup in manual mode, use the RAID configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the online document in the NEC EXPRESSBUILDER CD-ROM provided with the server. (The utility varies depending on the disk array controller board.) For details on the data transfer rate, RAID, and array configuration, see the manual provided with the disk array controller board as well as the online document.

Use of a disk expansion unit in a disk array configuration

A disk expansion unit is an exclusive device that can install up to 14 hard disk drives. (The number of hard disk drives depends on the model.) The server containing a disk array controller board can connect one or two of these devices. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.

> **IMPORTANT:** A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

An optional cable may be required to connect with a disk expansion unit. Refer to the manual coming with the disk expansion unit for details.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, or RAID5). (The utility varies depending on the board.) For details on settings and the setting methods, see the online document in the NEC EXPRESSBUILDER CD-ROM provided with the server or the manual provided with the board.

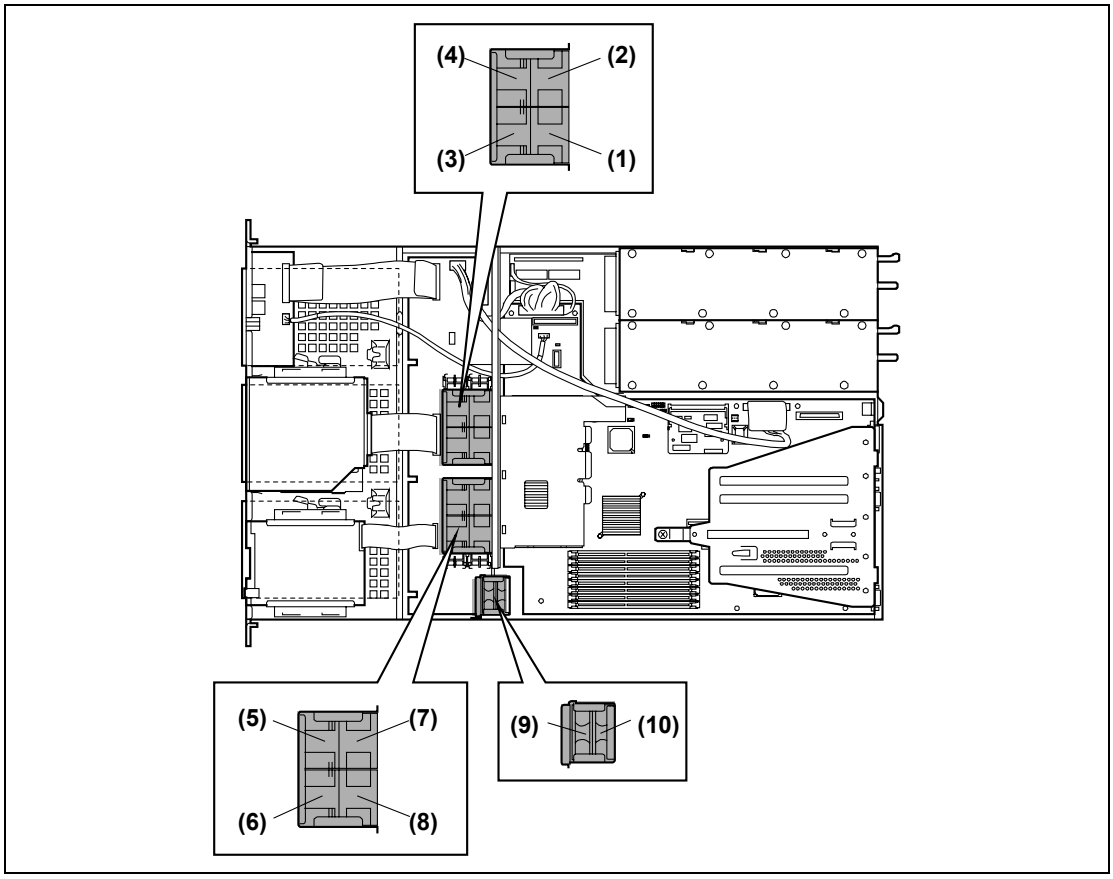
While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

Redundant Hot Swap-fan (SCSI Hard Disk Drive Model Only)

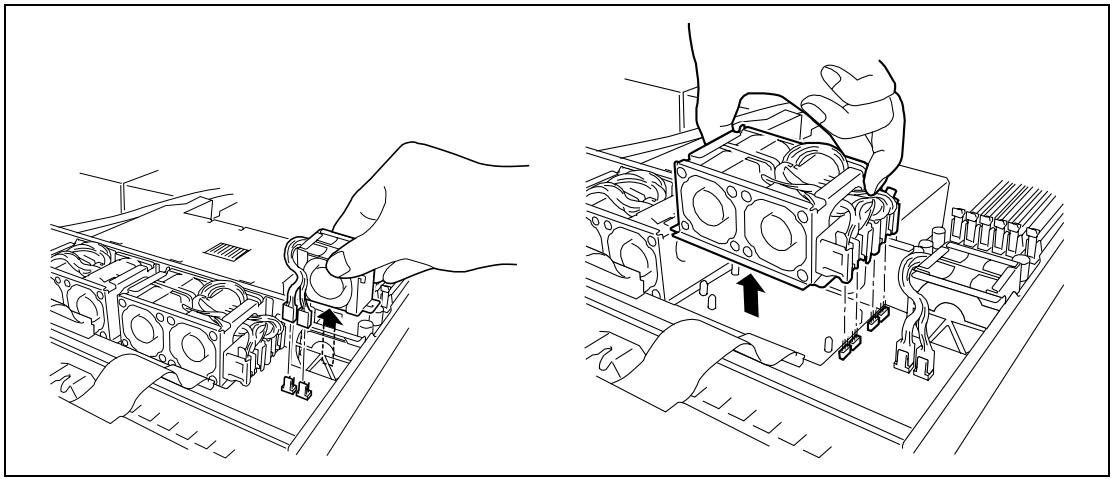
Your server can include four optional redundant hot-swap fans.

Installation

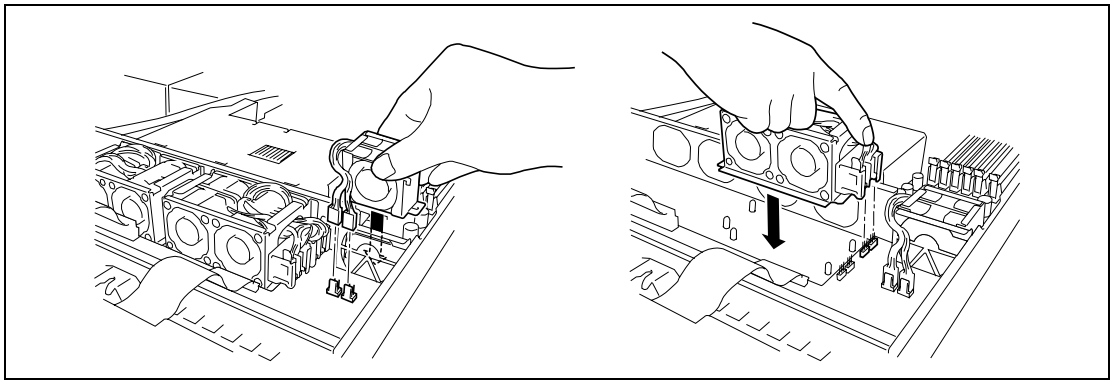
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the drive cover.
4. Locate the installation slot.



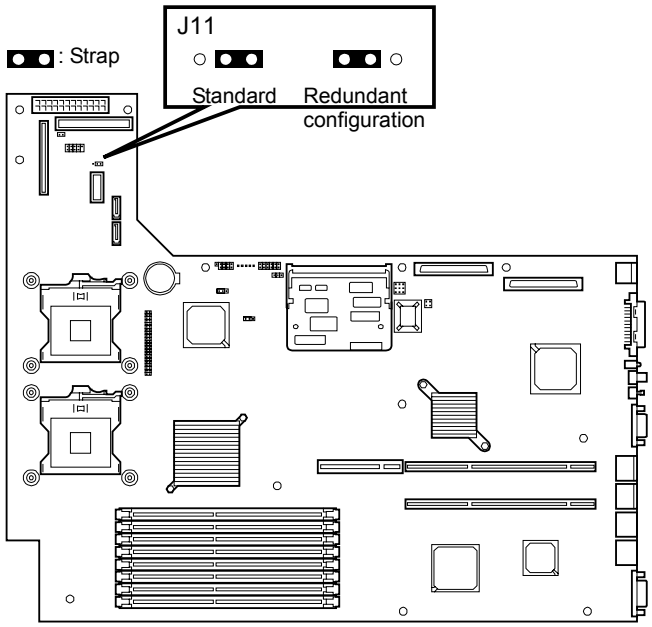
5. Disconnect all five fan cables from the mother board and remove all the fans from the chassis.



6. Install the fans as show figure below.



7. Change the jumper (J11) setting as shown in figure below.



IMPORTANT: To avoid system malfunction, leave other jumpers at its default position.

If the remote management card is installed in your server, follow these steps to configure the firmware program.

8. Place the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the server.

9. Run "Initialize Remote Management Card".

Refer to Chapter 6 for details.

Removal

Follow these steps to remove or replace the hot-swap fan.

1. Pull out the server from the rack.
2. Open the drive cover.
3. Locate the failed fan.

   Fault LED on the fan turns on when a fan failure occurs. A fan failure is also indicated by NEC ESMPRO and system event log.
4. While pressing release tabs on the top of the fan, pull the fan up to remove from the fan slot.
5. Install the new fan into the vacant slot.

   IMPORTANT: If all the redundant fans are removed. Change the jumper (J11) setting described earlier in the installation procedure.

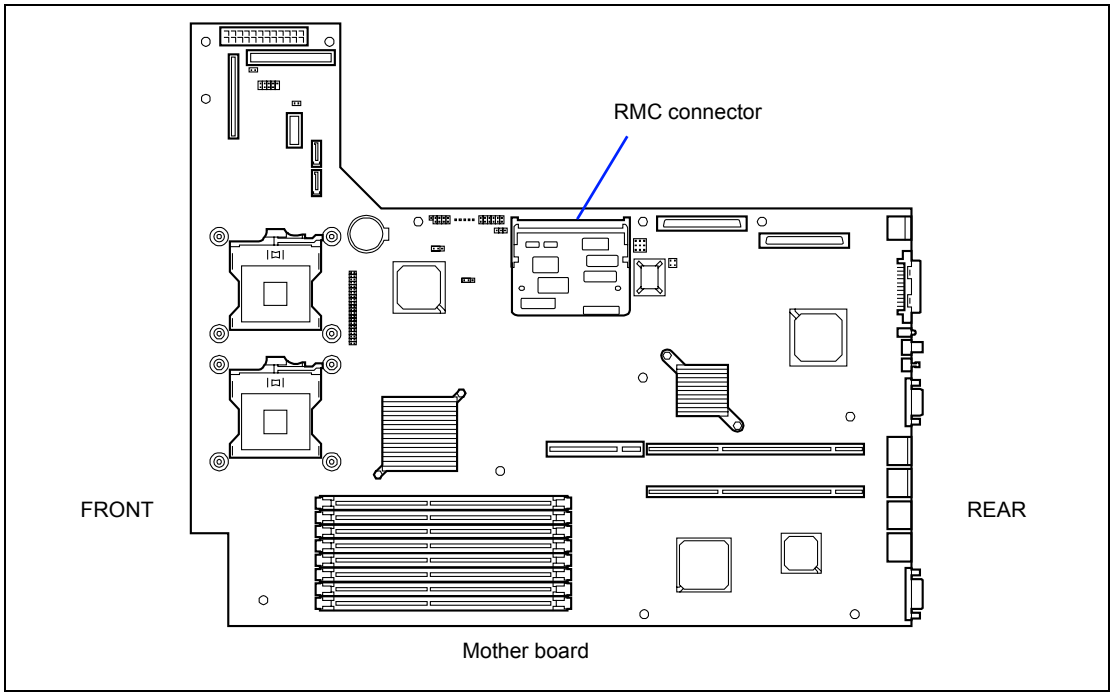
   If the remote management card is installed in your server, follow these steps to configure the firmware program.

Remote Management Card (RMC)

Remote Management card (RMC) is an optional expansion card that includes the Baseboard Management Controller (BMC) based on IPMI 1.5.

See Chapter 2 for detail functions of RMC.

IMPORTANT: The RMC is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the RMC. Do not touch the RMC terminal pins by bare hand or place the RMC directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.

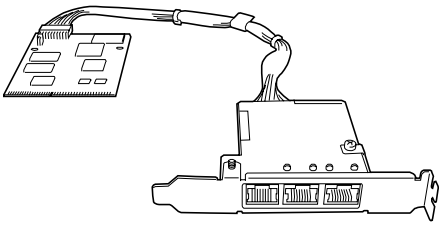


NOTE: The illustrations in this subsection might slightly differ from your remote management card.

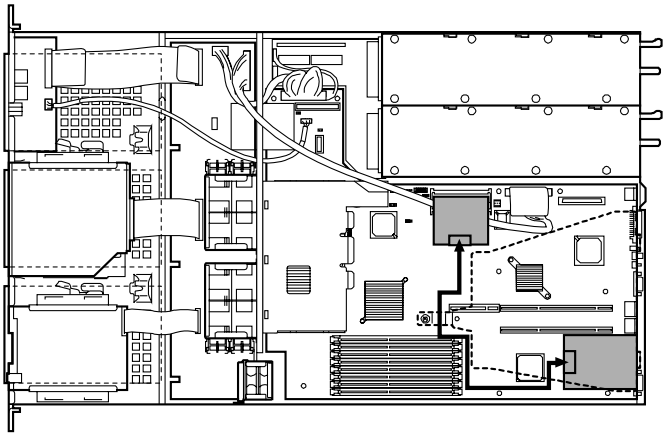
Installation

Follow these steps to replace the RMC with an optional Advanced Remote Management card (ARMC).

1. See section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Open the logic cover.
4. Assemble the management network card that attached to the ARMC and install the card to the riser card.
5. Connect the internal cable provided with ARMC to ARMC and the management network card as shown in the figure below.



The following figure shows the cable rooting of the internal cable.



6. Reassemble the server.
7. Turn on the server and check that the no error messages other than the following message are displayed on the POST screen.

```
H/W Configuration of BMC is corrupted.
!!Update BMC H/W Configuration by configuration tool!!
!!Refer to BMC configuration manual!!
```

Refer to Chapter 8 for POST error messages.

8. Place the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the server.

9. Run "Initialize Remote Management Card".

   Refer to Chapter 6 for details.

10. Run BIOS SETUP utility and check to see that the menus related to the RMC are displayed.

    Refer to Chapter 4 for details. If no additional menus are displayed, reinstall the RMC.

11. In the BIOS SETUP utility, select "Yes" for [Reset Configuration Data] in the [Advanced] menu.

    This setting is required to change the hardware configuration data. See Chapter 4 for details.

12. Reboot the server and run NEC EXPRESSBUILDER to save system information.

    Refer to Chapter 3 or 6 for details.

13. If the advanced remote management card is installed and KVM console feature is used, update the graphics accelerator (see Chapter 5).

    NOTE: Refer to the manual that comes with an optional advanced remote management card for the monitor resolution.

14. Override installation of NEC ESMPRO Agent if installed.

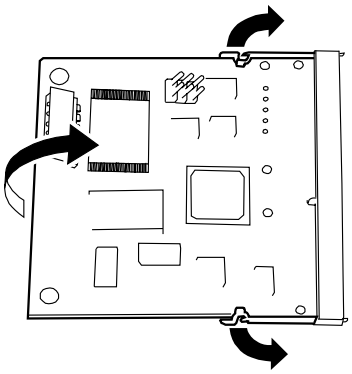
    To correct the system information and event log from the management PC, NEC ESMPRO Agent must be installed in the server.

Removal

1. See section "Preparing for Installation and Removal" described earlier to prepare.

   IMPORTANT: The remote management card logic monitors and logs system voltage changes. When removing the RMC from the motherboard, you may experience a 3 - 4 second delay from the time your system powering down.

2. Pull out the server from the rack.
3. Open the logic cover.
4. Open the levers on the both sides of the RMC connector to unlatch the RMC.



5. Remove the RMC from the connector.
6. Run BIOS SETUP utility and check to see that menus related to the RMC are not displayed in the Server menu.

   See Chapter 4 for details.

7. Run BIOS SETUP utility and select "Yes" for [Reset Configuration Data] in the [Advanced] menu.

   This setting is required to change the hardware configuration data. See Chapter 4 for details.

8. Override installation of NEC ESMPRO Agent if installed.

   To correct the system information and event log from the management PC, NEC ESMPRO Agent must be installed in the server.

Appendix A

Specifications

Item		NEC Express5800/120Rf-1 SCSI hot-plug hard disk drive model					
		N8100-1056F	**N8100-1057F**	**N8100-1058F**	**N8100-1121F**	**N8100-1122F**	**N8100-1099F**
CPU	Type	Intel® Xeon® processor					
	Clock/Cache	3.20DGHz /1MB	3.40GHz /1MB	3.60GHz /2MB	3.20GHz /2MB	3.40GHz /2MB	3.80GHz /2MB
	Standard	1					
	Maximum	2					
Chipset		E7520 (800MHz)					
Memory	Minimum	1GB (512MB×2)					
	Maximum	16GB (The standard DIMM must be replaced.)					
	Expansion unit	2 DIMMs (256MB/512MB/1GB/2GB)					
	Expansion times	3 times					
	Memory module	SDRAM DIMM (Low Profile DDR2-400 Buffered Type)					
	Error check	ECC					
Graphics (VRAM)		ATI RADEON 7000 (VRAM 16MB)					
Auxiliary input device	Floppy disk (standard)	3.5-inch drive × 1					
	Hard disk (standard)	None					
	Hard disk (maximum)	900 GB (300 GB × 3)					
	CD-ROM (standard)	ATAPI interface × 1 (Load on tray type, x24 speed)					
Hard disk drive bay		Slots: 3 RAID: RAID0, RAID1, RAID5 (option)					
Additional slot	PCI-X (64-bit/133MHz)	1 slot					
	PCI -X(64-bit/66MHz)	1 slot (low-profile)					
LAN interface		1000Base-T/100Base-TX/10Base-T (2 ports)					
External interface	Keyboard/mouse	MINI DIN 6-pin connector (1 port)					
	USB	4-pin (4 ports, 2 for front panel, 2 for rear panel)					
	Serial	DB-9 (2 ports, 1 for front panel, 1 for rear panel)					
	Network	RJ-45 (2 ports)					
	Display	MINI D-sub 15-pin (1 port)					
	SCSI	Ultra 320 SCSI (1 port)					
Power supply		1+1 (redundant option), hot-swappable					
Fan		5+5 (redundant option)					
Cabinet design		Rack-mount type (1U)					
External dimensions		425 (width) × 43 (height) × 718* (depth) mm					
Weight (Max.)		15 kg (20 kg)					
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz					
Power consumption (maximum)		470 VA, 465 W					
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)					
	Humidity	20 to 80% RH (no condensation)					
Others		NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration					

* Excluding the front bezel.

Item		NEC Express5800/120Rf-1 SATA fixed hard disk drive model			
		N8100-1059F	**N8100-1060F**	**N8100-1123F**	**N8100-1124F**
CPU	Type	Intel® Xeon® processor			
	Clock/Cache	3.20DGHz/ 1MB	3.60GHz/ 2MB	3.20GHz/ 2MB	3.80GHz/ 2MB
	Standard	1			
	Maximum	2			
Chipset		E7520 (800MHz)			
Memory	Standard	1GB (512MB×2)			
	Maximum	16GB (The standard DIMM must be replaced.)			
	Expansion unit	2 DIMMs (256MB/512MB/1GB/2GB)			
	Expansion times	3 times			
	Memory module	SDRAM DIMM (Low Profile DDR2-400 Buffered Type)			
	Error check	ECC			
Graphics (VRAM)		ATI RADEON 7000 (VRAM 16MB)			
Auxiliary input device	Floppy disk (standard)	3.5-inch drive × 1			
	Hard disk (standard)	None			
	Hard disk (maximum)	500 GB (250 GB × 2)			
	CD-ROM (standard)	ATAPI interface × 1 (Load on tray type, x24 speed)			
Hard disk drive bay		Slots: 2 RAID: RAID0, RAID1			
Additional slot	PCI-X (64-bit/133MHz)	1 slot			
	PCI -X(64-bit/66MHz)	1 slot (low-profile)			
LAN interface		1000Base-T/100Base-TX/10Base-T (2 ports)			
External interface	Keyboard/mouse	MINI DIN 6-pin connector (1 port)			
	USB	4-pin (4 ports, 2 for front panel, 2 for rear panel)			
	Serial	DB-9 (2 ports, 1 for front panel, 1 for rear panel)			
	Network	RJ-45 (2 ports)			
	Display	MINI D-sub 15-pin (1 port)			
	SCSI	None (for SCSI model only)			
Power supply		Non-hot-swappable			
Fan		5			
Cabinet design		Rack-mount type (1U)			
External dimensions		425 (width) × 43 (height) × 718* (depth) mm			
Weight (Max.)		15 kg (17 kg)			
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz			
Power consumption (maximum)		430 VA, 425 W			
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)			
	Humidity	20 to 80% RH (no condensation)			
Others		NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration			

* Excluding the front bezel.

Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The mother board includes the two network interface controllers that supports 10Base-T, 100Base-TX, and 1000Base-T networks and a capable of full or half duplex.

The both controllers can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Server Management Software

The NEC EXPRESSBUILDER CD-ROM that comes with the server contains the NEC ESMPRO utility.

NEC recommends that you should install the NEC ESMPRO for effective use of the reliability enhancement features of the server.

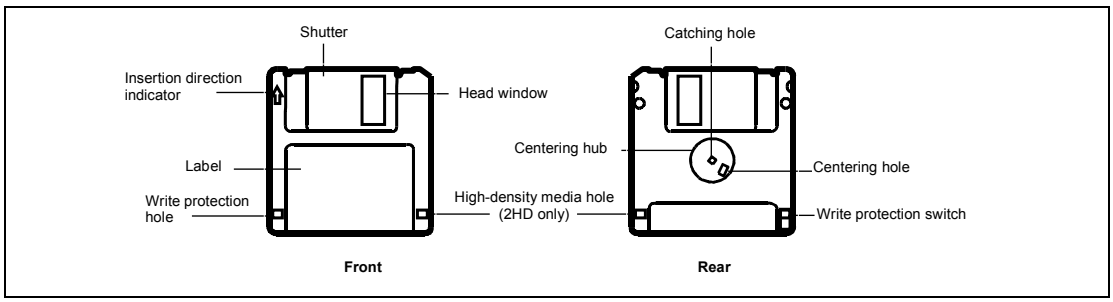
Floppy Disk

The following describes use of the floppy disk.

Floppy disk type

The server uses 3.5-inch floppy disks. You can use the following two types of 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Stores data of 720KB.



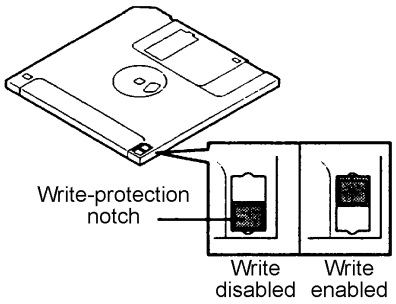
Notes on use

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Do not leave the floppy disk with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the floppy disk near any form of liquid or a chemical or in a place where a chemical may be accidentally sprayed over them.
- Do not place any magnetic objects (e.g., magnet) near the floppy disk.
- Do not clip the floppy disk or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

- Write-protection

  A floppy disk has a write-protect switch that prevents the stored data from accidental erasure.



  You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data.

  To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

- Disk format

  To write data into a floppy disk, the floppy disk must be "formatted." "Formatting" is to initialize the floppy disk and make it available for the system environment (operating system).

> **IMPORTANT:**
>
> - Formatting a used floppy disk clears all the data contained in it, if any.
> - Formatting a floppy disk from the DOS command line is not available with the server. Use a formatted floppy disk to work with it on the DOS command line.

  The format method depends on your operating system. Refer to the manual that comes with your operating system for details.

- Data backup

  "Data backup" is to copy data stored in a media into another media (e.g., floppy disk, digital audio tape, or magnet-optical disk).

> **IMPORTANT:** Make sure to make a back-up copy of every floppy disk, if provided.

  The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or server failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis.

CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- Press the center of the storage case to remove the CD-ROM from the case.
- Do not drop the CD-ROM.
- Do not place anything on the CD-ROM or bend the CD-ROM.
- Do not attach any label onto the CD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the CD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.
- Do not leave the CD-ROM with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the CD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the CD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the CD-ROM in a CD-ROM case when not in use.

Tape Media

The following describes data handling with the DAT, DLT, or AIT optionally available for the server.

- Saving your valuable data

  When you save your valuable data or programs into the cartridge tape, you should save them into two cartridge tapes to make the primary and secondary tapes.

  This enables you to restore your data from one tape when the other makes a read error, as well as to protect your valuable data and programs from loss.

- Three-generation data management

  NEC recommends that you should employ three-generation data management for data storage.

  Three-generation data management uses three cartridge tapes: A, B, and C. You save data to tape A on the first day, tape B on the second day, tape C on the third day, tape A on the forth day, and so on. That is, you save data into cartridge tapes cyclically from tape A through C.

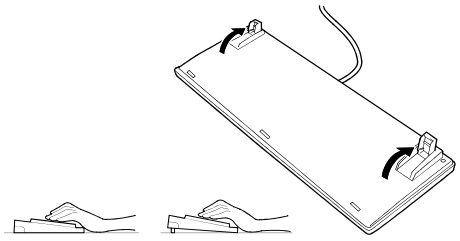
This enables you, for example, to use tape B to restore the data when tape C makes a read error. Also when both tapes B and C make a read error, you can restore your valuable data by using the data stored in tape A.

Keyboard

The keyboard is a device to instruct you computer by entering alphanumeric characters or symbols.

IMPORTANT:

- Do not pour any liquid such as water or put anything into the keyboard. Doing so may cause a failure of the keyboard.
- The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



NOTE: The keyboard functions depend on the software. Refer to the manual that comes with the software for details.

Mouse

Like the keyboard, the mouse is a device to instruct your computer. Many OS's and application software require the mouse for operation.

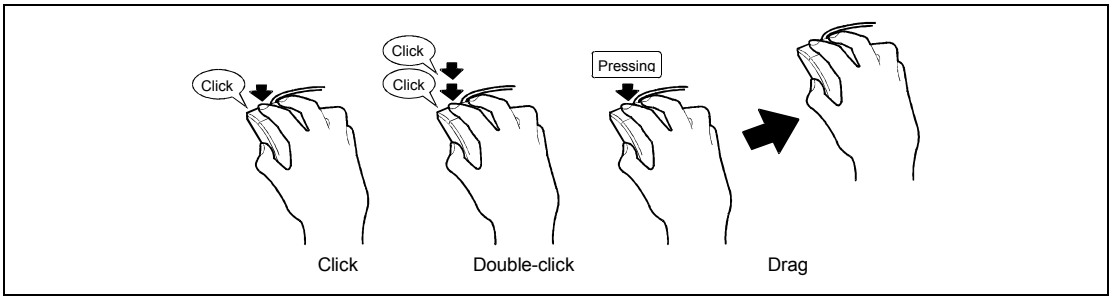
NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.
- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)

Mouse operation includes "Click," "Double-click," and "Drag."

Click:	Press the button only once and release it.
Double-click:	Press the button twice consecutively and release it.
Drag:	Press and hold the button and move the mouse.

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.



Appendix C

IRQ

The factory-set interrupt requests is listed below. Find an appropriate one to install an optional device.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	Mouse
1	Keyboard	13	Numeric processor
2	–	14	Primary IDE
3	COM2 serial port (PCI)	15	Secondary IDE
4	COM1 serial port (PCI)	16	USB
5	PCI	17	VGA
6	Floppy disk drive	18	–
7	PCI	19	USB
8	Real-time clock	30	LAN1
9	ACPI compliant system	31	LAN2
10	PCI	49	Adaptec SCSI
11	PCI	50	Adaptec SCSI

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Appendix D

Installing Windows Server 2003 x64 Editions

This section explains how to install the Windows Server 2003 x64 Editions.

BEFORE INSTALLING WINDOWS SERVER 2003 X64 EDITIONS

Please read carefully the following information BEFORE commencing your Windows Server 2003 x64 Editions Installation.

Optional Board Supported by NEC EXPRESSBUILDER

NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

<SCSI Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SCSI) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

<SATA Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SATA) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

Updating System

If you modified the Windows system, execute "Update Express5800 system" in Master Control Menu.

Re-installing to the Hard disk Drive which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk drive upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-80F/81F and SCSI HostRAID and SATA HostRAID Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally. Disconnect MO Device and restart the installation from the beginning.

Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 4100MB
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 1MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 1MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

4100MB + (512MB * 1.5) + (512MB + 1MB) + Application Size
= 5381MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS SERVER 2003 X64 EDITIONS

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 R2 Standard x64 Edition / Microsoft Windows Server 2003 R2 Enterprise x64 Edition / Microsoft Windows Server 2003 Standard x64 Edition / Microsoft Windows Server 2003 Enterprise x64 Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003 x64 Edition, you do not need to create it again.

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
4. Press the RESET switch or press **Ctrl** + **Alt** + **Delete** to reboot the server .(You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].

6. Select [Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.
7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

– Windows Server 2003 x64 Editions
– Windows Server 2003
– Windows XP x64 Edition
– Windows XP
– Windows 2000
– Windows Me/98/95
– Windows NT 4.0

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Run the operating system.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

   [Master Control Menu] will appear.
4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003 x64 Edition]

   NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

   Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows Server 2003 x64 Editions Clean Installation

This section explains how to perform a clean installation of Windows Server 2003 x64 Editions.

1. Turn on the system power.
2. Insert the Windows Server 2003 x64 Edition CD-ROM into the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk drive, this step is unnecessary.

   The Windows Server 2003 x64 Editions setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.

7. Select the proper SCSI Adapter and press **Enter**.

   – Adaptec HOSTRAID driver for Windows XP/2003 x64 Edition
   (When Adaptec HOSTRAID (SCSI) is installed.)

   – Adaptec SATA driver for Windows XP/2003 x64 Edition
   (When Adaptec HOSTRAID (SATA) is installed.)

   – MegaRAID SCSI 320-1 RAID Controller Driver
   (When N8103-80F board is installed.)

   – MegaRAID SCSI 320-2 RAID Controller Driver
   (When N8103-81F board is installed.)

   Continue performing tasks according to the subsequent messages that appear.

8. When the following message is shown, press **Enter** to start "Welcome to Setup".

9. When the installation of Windows Server 2003 has finished, the system reboots automatically.

   – Windows Server 2003 x64 Editions has installed: Go on the step 13

   – Windows Server 2003 R2 x64 Editions has installed: Go on the step 10

10. The [Windows setup] screen will be displayed after logged on to the system.

    IMPORTANT:

    - In this case, the [Windows setup] screen may not be displayed.
      Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 according to the following procedures.
    - You can install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 after the application of "System update".
      Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2.
      In this case, note that the [Windows setup] screen is not displayed.

11. Insert Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the CD-ROM drive.

    Confirm the parameters and click [OK].

12. When the installation has completed, remove Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the CD-ROM drive, and restart the system.

13. When the installation has completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of manual.

Reinstallation to Multiple Logical drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   ```
   Changing the drive letter of a volume may cause programs to no
   longer run. Are you sure you want to change this drive letter?
   ```

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. The [Windows Explorer] dialog starts.
   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].
   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\W2K3AMD\NS1\PROSET\WS03_32E

   The [Intel(R) PROSet - Install Shield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Click [Install].
7. When [Install Shield Wizard Completed] window is displayed, click [Finish].
8. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].

   * The procedure in the case of the classic start menu

     Click Start menu, click [Settings] and click [Network Connections].

     The [Network Connections] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
5. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Link] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.
4. Click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" in Chapter 5.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-86/88/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/88/111)

"CD-ROM Drive Letter:\WINNT\W2K3AMD\NS1\PRO100\WS03_32E"

In case of utilizing (N8104-112/103/113/109/115)

"CD-ROM Drive Letter:\WINNT\W2K3AMD\NS1\PRO1000\WS03_32E"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)].

   [(Network Adapter Name) Properties] appears.

   NOTE: [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify [CD-ROM driveletter:\WINNT\W2K3AMD\NS1\PRO100\WS03_32E].

   And when using [(N8104-112/103/113/109/115)], specify [CD-ROM driveletter:\WINNT\W2K3AMD\NS1\PRO1000\WS03_32E].

   Then click [Next].
7. Click [Finish].

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. Open the Network Adapter property from the Device Manager.
2. Select the [Teaming] tab, check "Team with other adapters" and click [New Team].
3. Enter a name of the team and click [Next].
4. Check adapters to be included in the team and click [Next].
5. In [Select a team mode], select [Adapter Fault Tolerance] or [Adaptive Load Balancing] and click [Next].
6. Click [Finish].
7. From the Device Manager, open the device property of the team name set above, select the [Settings] tab, and click [Modify Team].
8. To set an adapter in the team as the primary adapter, select a driver and click [Set Primary].

   To set an adapter in the team as the secondary adapter, select a driver and click [Set Secondary].

   After terminating both settings, click [OK] and close the screen.

Re-install the Network Driver

The network driver will be installed automatically.

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

* For the graphics accelerator driver for Windows Server 2003 x64 Editions, the use of a remote KVM console that installs the advanced N8115-02 remote management card is supported by the standard. A special driver need not be installed.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K3AMD\VIDEO\SETUP.EXE
4. Follow the message to continue the installation.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

Installing SCSI Controller Driver (N8103-56/75/95/N8190-126)

If you utilize SCSI controller driver (N8103-56/75/95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix E

Installing Windows Server 2003

This section explains how to install the Windows Server 2003 without using Express Setup.

BEFORE INSTALLING WINDOWS SERVER 2003

Please read carefully the following information BEFORE commencing your Windows Server 2003 Installation.

Optional Board Supported by NEC EXPRESSBUILDER

NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

<SCSI Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - N8103-86 Disk Array Controller (0ch)
  - Adaptec HostRAID(SCSI) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

<SATA Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SATA) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update Express5800 system" in Master Control Menu.

Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk drive upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-80F/81F/86 and SCSI HostRAID and SATA HostRAID Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally. Disconnect MO Device and restart the installation from the beginning.

Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 2900MB (Only Windows Server 2003) 3500MB (Windows Server 2003 with Service Pack1) 4400MB (Windows Server 2003 + Service Pack1 CD-ROM)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

2900MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 4192MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

About the Upgrade to Windows Server 2003 R2

The "in-place upgrade" from Windows Server 2003 to Windows Server 2003 R2 is not recommended because it may overwrite any files or registries, and cause unexpected impact to the system or the applications.

If you install Windows Server 2003 R2, backup user data referring "Windows Server 2003 Clean Installation", and reinstall Windows Server 2003 R2.

NOTE: "in-place upgrade" is to perform overwrite upgrade from Windows Server 2003 which already installed to Windows Server 2003 R2.

INSTALLING WINDOWS SERVER 2003

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 R2 Standard Edition / Microsoft Windows Server 2003 R2 Enterprise Edition / Microsoft Windows Server 2003 Standard Edition / Microsoft Windows Server 2003 Enterprise Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER
- Windows Server 2003 Service Pack (CD-ROM)

Creating "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003, you do not need to create it again.

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.
4. Press the RESET switch or press **Ctrl** + **Alt** + **Delete** to reboot the server .(You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].

6. Select [Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.
7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64 Editions
- Windows Server 2003
- Windows XP x64 Edition
- Windows XP
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Run the operating system.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

   [Master Control Menu] will appear.
4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003].

   NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

1. Turn on the system power.
2. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk drive, this step is unnecessary.

   The Windows Server 2003 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   SATA Model: A list of mass storage devices is displayed.

   SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32)] and press **Enter**.

7. Select the proper SCSI Adapter and press **Enter**.

   – Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003
   (When Adaptec HostRAID (SCSI) is installed.)

   – Adaptec Embedded Serial ATA HostRAID Driver For Windows 2000/XP/2003
   (When Adaptec HostRAID (SATA) is installed.)

   – MegaRAID SCSI 320-1 RAID Controller Driver
   (When N8103-80F board is installed.)

   – MegaRAID SCSI 320-2 RAID Controller Driver
   (When N8103-81F board is installed.)

   – Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003
   (When N8103-86 board is installed.)

   Continue performing tasks according to the subsequent messages that appear.

8. When the following message is shown, press **Enter** to start "Welcome to Setup".

9. When the installation of Windows Server 2003 has finished, the system reboots automatically.

   – Windows Server 2003 has installed: Go on the step 13

   – Windows Server 2003 R2 has installed: Go on the step 10

10. When Windows Server 2003 R2 has been installed, the [Windows setup] screen will be displayed after logged on to the system.

    IMPORTANT:

    - In this case, the [Windows setup] screen may not be displayed.
      Be sure to install Microsoft Windows Server 2003 R2 DISC 2
      according to the following procedures.
    - You can install Microsoft Windows Server 2003 R2 DISC 2 after
      the application of "System update".
      Be sure to install Microsoft Windows Server 2003 R2 DISC 2.
      In this case, note that the [Windows setup] screen is not displayed.

11. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the CD-ROM drive.

    Confirm the parameters and click [OK].

12. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the CD-ROM drive, and restart the system.

13. When the installation has completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of manual.

Upgrade Installation

> **IMPORTANT:** It is not the procedure of upgrade installation to Windows Server 2003 R2 from Windows Server 2003.
> Please refer to [About the upgrade to Windows Server 2003 R2] for details.

> **NOTE:** Please do the upgrade installation after deleting the graphics accelerator driver.

Procedures below upgrade the installed Windows 2000 to Windows Server 2003.

1. Power on the system and start Windows 2000.
2. Log on as an administrator.
3. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.

   Then, [Select an operation] dialog will appear.

   > **NOTE:** If the [Select an operation] dialog box does not appear, start \SETUP.EXE from CD-ROM drive.

4. Select [Install Windows Server 2003].

   Then, a dialog box asks to select the upgrade or clear installation.
5. Select "Upgrade (recommended)" and click the Next.

   Follow the messages and continue. The system will automatically restart after copying the files.

   > **NOTE:** You can leave the Windows Server 2003 CD-ROM in CD-ROM drive.

6. If the RAID controller or SCSI controller is installed in the system, press **F6** while a message, "Press F6 if you need to install a third party SCSI or RAID driver...", is on the screen.

   > **IMPORTANT:** There is no visible indication on screen when F6 has been pressed.

7. When the following message is displayed, press **S**.

```
Setup could not determine the type of one or more mass storage devices
installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices.
```

The following message is displayed.

```
Please insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.
```

8. Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**. A list of SCSI adapters will be displayed.

SATA Model: A list of mass storage devices is displayed.

SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32)] and press **Enter**.

9. If the optional board is installed, select the proper SCSI Adapter and press **Enter**.

- Adaptec Ultra160 SCSI Cards (Win Server 2003)(When N8103-56 board is installed.)
- Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32) (When N8103-75 board is installed.)
- Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86 board is installed.)
- Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When Adaptec HostRAID (SCSI) is installed.)
- Adaptec Embedded Serial ATA HostRAID Driver For Windows 2000/XP/2003 (When Adaptec HostRAID (SATA) is installed.)
- MegaRAID SCSI 320-1 RAID Controller Driver (When N8103-80F board is installed.)
- MegaRAID SCSI 320-2 RAID Controller Driver (When N8103-81F board is installed.)

Continue performing tasks according to the subsequent messages that appear.

10. When the following message is shown, press **Enter** to start "Welcome to Setup".

11. When the installation of Windows Server 2003 has finished, the system reboots automatically.

- Windows Server 2003 has been installed: Go on the step 15.
- Windows Server 2003 R2 has been installed: Go on the step 12.

12. When Windows Server 2003 R2 has been installed, the [Windows setup] screen will be displayed after logged on to the system.

IMPORTANT:

- In this case, the [Windows setup] screen may not be displayed. Be sure to install Microsoft Windows Server 2003 R2 DISC 2 according to the following procedures.
- You can install Microsoft Windows Server 2003 R2 DISC 2 after the application of "System update". Be sure to install Microsoft Windows Server 2003 R2 DISC 2. In this case, note that the [Windows setup] screen is not displayed.

13. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the CD-ROM drive.

Confirm the parameters and click [OK].

14. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the CD-ROM drive, and restart the system.

15. When the installation has completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of manual.

- SCSI controller (N8103-56)

  If your system has a controller (N8103-56), following message often appears on the display during the upgrade installation to Windows Server 2003.

  ```
  Please type D:/i386 and click OK. (D: CD-Drive)
  Insert disk
  The file 'adpu160m.sys' on Adaptec Windows 2000 Family Manager set V1.12 S2 is needed.
  ```

  Type the path where the file is located, and then click OK.

- If PROSet is already installed, uninstall the PROSet before upgrading.

  If the teaming function is enabled, disable the function before uninstalling PROSet.

- During upgrade installation, [Disk Insert] dialog box may appear.

  If it appears, click Cancel.

- When upgrade installation is completed, [Device Driver Wizard] dialog box may appear.

  If it appears, click Cancel, then update the system.

Reinstallation to Multiple Logical drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System - Installing Service Pack -

IMPORTANT: If you install Windows Server 2003 CD-ROM which contains Service Pack 1 to your system, you do not have to apply Service Pack 1 again.

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSET.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\DOTNET\BC5\PROSET\WS03XP32

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet for Wired Connections] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

NOTE: We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" in Chapter 5.

Re-install the Network Driver

The network driver will be installed automatically.

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

* For the graphics accelerator driver, the use of a remote KVM console that installs the advanced N8115-02 remote management card is supported by the standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\DOTNET\VIDEO\SETUP.EXE
4. Follow the message to continue the installation.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

Installing SCSI Controller Driver (N8103-65F)

If you utilize SCSI controller driver (N8103-65F), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-75)

If you utilize SCSI controller driver (N8103-75), install it according to the following procedure:

<In the case of use of Windows Server 2003 SevicePack1 or Windows Server 2003 R2>

If you utilize SCSI controller driver (N8103-75), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

<In the case of Windows Server 2003 which has not installed SevicePack1>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools]→ [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].

   [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56/-95/N8190-126)

If you utilize SCSI controller driver (N8103-56/95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing Disk Array Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003, connect the controller and take the following steps to install the driver:

<In the case of use of Windows Server 2003 SevicePack1 or Windows Server 2003 R2>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

<In the case of Windows Server 2003 which has not installed SevicePack1>

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

About Windows Activation

Windows Server 2003 must be activated before you can use Windows Server 2003.

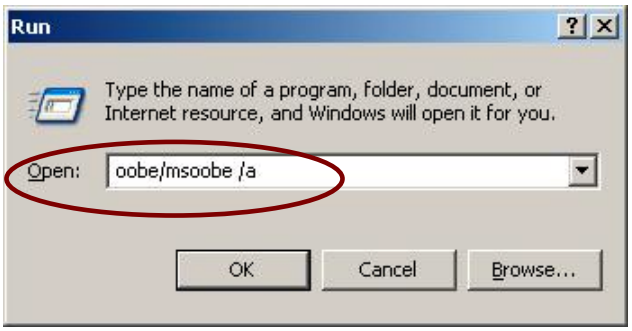
Windows activation process is as follows.

> **NOTE:** When you use Windows Server 2003 R2, activation process is not needed.

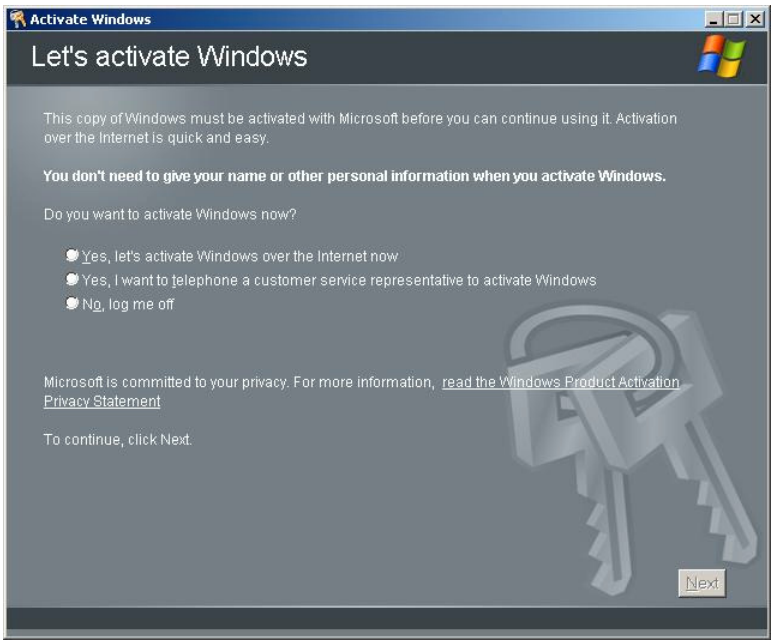
1. Click [Run] on [Start] menu.

   Type as follows in the [Open:] box, and click [OK].

   oobe/msoobe /a

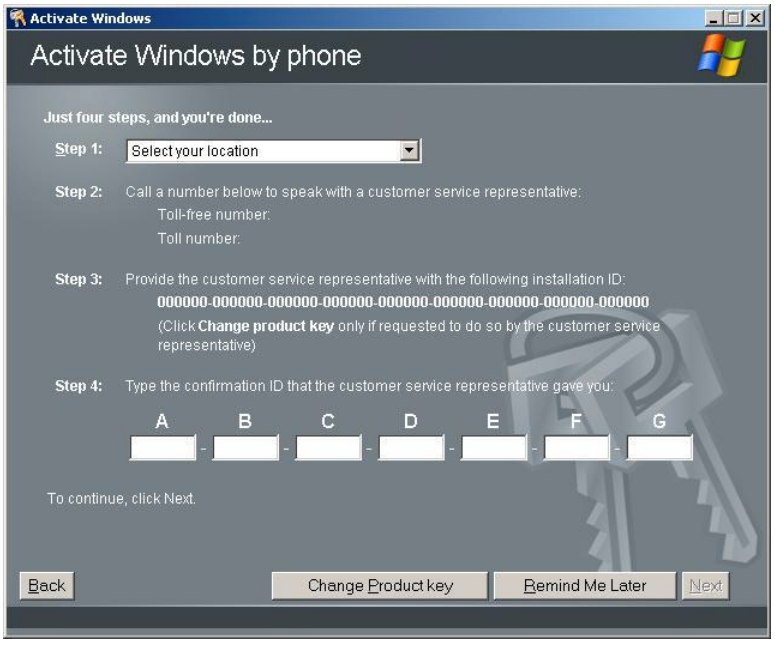


2. When the screen as follows is displayed, click [Next].


Activate Windows
Let's activate Windows
This copy of Windows must be activated with Microsoft before you can continue using it. Activation over the Internet is quick and easy.
You don't need to give your name or other personal information when you activate Windows.
Do you want to activate Windows now?
Yes, let's activate Windows over the Internet now
Yes, I want to telephone a customer service representative to activate Windows
No, log me off
Microsoft is committed to your privacy. For more information, read the Windows Product Activation Privacy Statement
To continue, click Next.
Next

The following screen is displayed.

3. Process "Windows activation" according to the following message.



Available Switch Options for Windows Server 2003 Boot.ini File

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

  "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003" /fastdetect
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect
   /PAE
   C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Installing Windows 2000

This section explains how to install the Windows 2000 without using Express Setup tool.

BEFORE INSTALLING WINDOWS 2000

Please read carefully the following information BEFORE commencing your Windows 2000 Installation.

Optional Board Supported by NEC EXPRESSBUILDER

NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

<SCSI Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - N8103-86 Disk Array Controller (0ch)
  - Adaptec HostRAID(SCSI) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

<SATA Model>

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-81F Disk Array Controller (SCSI 2ch)
  - Adaptec HostRAID(SATA) (Controller on the I/O board)
- Other optional boards
  - N8103-56 SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-75 SCSI Controller
  - N8103-95 SCSI Controller
  - N8190-126 SCSI Controller

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update Express5800 system" in Master Control Menu.

Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk drive upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-80F/81F/86 and SCSI HostRAID and SATA HostRAID Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally. Disconnect MO Device and restart the installation from the beginning.

Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 1000MB
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

1000MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 2292MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS 2000

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows 2000 Server / Microsoft Windows 2000 Advanced Server (CD-ROM)
- Windows 2000 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows 2000, you do not need to create it again.

You can create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the Server.
4. Press the RESET switch or press **Ctrl**, **Alt** and **Delete** to reboot the server .(You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows 2000 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64 Editions
- Windows Server 2003
- Windows XP x64 Edition
- Windows XP
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0

You can create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Run the operating system.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

   [Master Control Menu] will appear.

4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows 2000].

   NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

   Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows 2000 Clean Installation

This section explains how to perform a clean installation of Windows 2000.

1. Turn on the system power.
2. Insert the Windows 2000 CD-ROM in the CD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk drive, this step is unnecessary.

   The Windows 2000 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. If the RAID controller (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   SATA Model: A list of mass storage devices is displayed.

   SCSI Model: Select the [Adaptec Ultra320 SCSI Cards (Win2000)] and press **Enter**.

   Then, it returns to the screen of Procedure 5.

7. Select the proper SCSI Adapter and press **Enter**.
   - Adaptec HostRAID U320 Driver Ver 1.02 For Windows 2000/XP/2003 (When Adaptec HostRAID (SCSI) is installed.)
   - Adaptec Embedded Serial ATA HostRAID Driver for Windows 2000/XP/2003 (When Adaptec HostRAID (SATA) is installed.)
   - MegaRAID SCSI 320-1 Controller Driver (When N8103-80F board is installed.)
   - MegaRAID SCSI 320-2 Controller Driver (When N8103-81F board is installed.)
   - Adaptec I2O RAID Driver Disk for 32bit Windows 2000/XP/2003 (When N8103-86 board is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

Reinstallation to Multiple Logical Drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System - Installing Service Pack -

IMPORTANT: This system does not support Windows 2000 Service Pack 1 - 3.
If you install Windows 2000 CD-ROM which contains Service Pack 4 to your system, you do not have to apply Service Pack 4 again.

NOTE: If you run the Update of System with the MO device connected, refer following attention.

<If you insert the MO media>
Remove MO media from the MO device immediately after clicking on [Restart Computer].

<If you do not insert the MO media>
If the message "There is no disk in the drive. ..." is shown during the Update of System, click [Cancel] or [Continue] and continue the update.

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [Restart Computer] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhance through put between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Program], [Accessory] and click [Explorer].
3. Run "PROSET.EXE" in the following directory.

   <CD-ROM DriveLetter>:\WINNT\W2K\BC5\PROSET\WIN2K\

   The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

   The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

   The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

   The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex]value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" in Chapter 5.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

   The [Intel(R) PROSet for Wired Connections] dialog box appears. Double-click the [Intel(R) PROSet Wired] icon.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Re-install the Network Driver

After installing OS and deleting the network drivers, if you want to re-install the network drivers, follow the procedure below.

1. Restart OS and logon to your system.
2. [Upgrade Device Driver Wizard] dialog box appears.

   Click [Next].
3. Confirm that the [Search for a suitable driver for my device (recommended)] radio button is selected and click [Next].
4. Select the [Specify a location] check box and deselect other check boxes.

   Click [Next].
5. Other [Upgrade Device Driver Wizard] dialog box opens.

   When using [Intel(R) PRO/1000MT Dual Port Network Connection], specify [<CD-ROM drive letter>:\WINNT\W2K\BC5\PRO1000\WIN2K].

   Then click [OK].
6. Click [Next].
7. Click [Finished].

   After re-installing the network drivers, the link speed and Duplex mode need to be specified.

   Refer to "Network Driver" described earlier.

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

* For the graphics accelerator driver, the use of a remote KVM console that installs the advanced N8115-02 remote management card is supported by the standard.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\VIDEO\SETUP.EXE
4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

   If the dialog message "Direct X Ver.8 isn't installed." appears, select [continue] to continue.
5. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

USB 2.0 Driver

USB 2.0 Driver is pre-installed. When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] → [Computer Management].
2. Double click the SCSI Controller driver which Device Manager lists as unknown device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].
   - [INITIO INI-A10XU2W PCI SCSI Controller]
     (When N8103-65F board is installed.)
   - [Adaptec SCSI Card 29320ALP - Ultra320 SCSI]
     (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56/95/N8190-126)

If you utilize SCSI controller driver (N8103-56/95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows 2000, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].
2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].
3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2000 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
4. When the [Driver Files Search Results] dialog box appears, click [Next].
5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Available switch options for Windows 2000 Boot.ini file.

Many different switches will be available if you edit Boot.ini File.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 170756

  "Available Switch Options for the Windows NT Boot.ini File"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Programs], point to [Accessories], and then click [Notepad].
2. On the [File] menu, click [Open...].
3. In the [Open] dialog box, in the [Look in] drop-down list box, click "%systemroot%" drive.
4. In the [Open] dialog box, in the [Files of type] drop-down list box, click "All Files" and in the [File name] drop-down list box, enter "Boot.ini". And then, click [Open].

   The content of Boot.ini file will be displayed.
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(1)\WINNT
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000" /fastdetect
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000, PAE" /fastdetect /PAE
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix G

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#7, #8	Size		Serial No.		Date Installed	
#5, #6	Size		Serial No.		Date Installed	
#3, #4	Size		Serial No.		Date Installed	
#1, #2	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk Drive						
ID0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

Backup Device						
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #1C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3C						
	Model name				Serial No.	
					Date Installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version				
OS Application of RUR media	 ☐ Apply	Name: Name:		Version: Version:
File system	☐ FAT ☐ Others (	☐ HPFS	☐ NTFS)	
Bundled software installed				
Licensed software installed				
Application running when a failure occurred				

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